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TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

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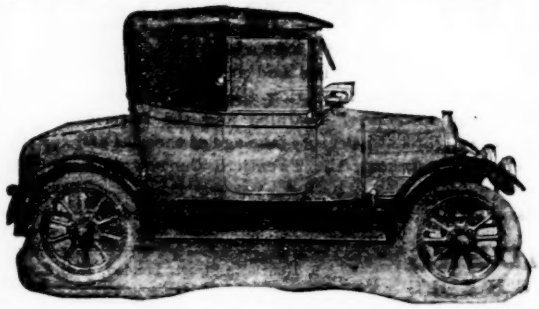

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ON

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Delivered before the Royal College of Physicians of London on Oct. 18th, 1918,

BY PERCY KIDD, M.D.OXON., F.R.C.P. LOND.,

PHYSICIAN, LONDON HOSPITAL; CONSULTING PHYSICIAN, HOSPITAL FOR CONSUMPTION AND DISEASES OF CHEST, BROMPTON, ETC.

MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GUESTS,—Rather more than 300 years ago, in his Lumleian Lectures delivered in 1616, William Harvey first made known the results of his experiments on the circulation of the blood, though his complete work was not given to the world until 1628. The story of his great discovery has often been told, and well told. I shall not attempt to emulate the felicitous language of my predecessors. Much has been written about Harvey's life and work, perhaps more still remains to be discovered. But success in this kind of research is not given to everyone. If I had felt that it would be my duty on this occasion to attempt to add another stone to the already imposing cairn erected to Harvey's memory, I should not stand here to-day.

In 1656, the year before his own death, Harvey made provision for the annual delivery of an oration to commemorate the benefactors of the College, to exhort the Fellows and Members of the College to search out the secrets of nature by way of experiment, and to continue in mutual love and affection amongst themselves.

This year we have no bequests to record. In previous orations grateful mention has been made of the many benefactions which have been received, and the College has ever been mindful of generous donors.

HARVEY AND THE VALUE OF RESEARCH.

In his injunction to the Fellows and Members of the College to search out the secrets of nature by way of experiment, Harvey urges others to follow the practice which, in his hands, had led to such great results. His discovery of the circulation of the blood was founded on experiment and could not have been worked out in any other way. While learned physicians were engaged in subtle metaphysical discussions about disease, Harvey addressed himself to his own experimental work until he felt justified in publishing his revolutionary results.

In his introduction to the "Treatise on the Generation of Animals" Harvey pours contempt on the exclusive reference in all discussion to the authority of the great men of the past in these words:—

> "The method of investigating truth commonly pursued at this time therefore is to be held as erroneous and almost foolish, in which so many inquire what others have said, and omit to ask whether the things themselves be actually so or not."

Yet Harvey was no despiser of the Ancients, as his numerous references to Aristotle and Galen attest.

At the present day there is no fear of undue respect being paid to the Old Masters; nay, the young lions of the twentieth century are too well satisfied with their own prowess to devote much thought to an ignorant age that knew nothing of vaccines, blood cultures, test meals, blood counts, and other revelations of these latter days.

In this crisis of our history, when all men's thoughts are directed to the life-and-death struggle which our country is waging in defence of the liberties of the world against the sinister forces of reaction, let us recall the period of Harvey's lifetime that immediately followed the execution of Charles the First.

At this troublous and disturbed time Harvey had retired from London, and the following account of a visit paid to him in his retirement by Ent has a special interest for us to-day. In his introduction to Harvey's "Anatomical Exercises on the Generation of Animals," published in 1651, Ent thus addresses "the learned and illustrious the President and Fellows of the College of Physicians of London":—

> "Harassed with anxious and in the end not much availing cares, about Christmas last (the year after the violent death of the King.—Ed.) I sought to rid my spirit of the cloud that oppressed it by a visit to that great man, the chief honour and ornament of our College, Dr. William Harvey, then dwelling not far from the city: I found him, Democritus-like, busy with the study of natural things, his countenance cheerful, his mind serene, embracing all within its sphere.
>
> I forthwith saluted him and asked if all were well with him.
>
> 'How can it,' said he, 'whilst the Commonwealth is full of distractions, and I myself am still in the open sea? And truly,' he continued, 'did I not find solace in my studies, and a balm for my spirit in the memory of my observations of former years I should feel little desire for longer life? But so it has been, that this life of obscurity, this vacation from public business, which causes tedium and disgust to so many, has proved a sovereign remedy to me.'"

We may feel sure that had Harvey lived in these days, when not only the Commonwealth of England but the whole world is full of distractions, he would still have found solace in his studies. What Harvey did we may all do according to our several capacities. Those of us who, from one cause or another, are unable to render direct service to the State can yet help to carry on the civil life of the community which is indispensable to the successful conduct of one of the most righteous wars in which our country has ever been engaged.

It is hardly necessary at the present day to insist on the value of experiment in the elucidation of disease, and Harvey's injunction to search out the secrets of nature by way of experiments has now lost something of its original point. To-day experiment is in the air. And though much of the laboratory work published appears sterile and inconclusive, all additions to the sum of knowledge, however small and indirect, must have their value. In no disease, perhaps, has the beneficent influence of experiment been more strikingly exemplified than in consumption or tuberculosis. Experiment has been the light that lightened our darkness.

The seventeenth century, with its many wonderful achievements in literature, art, and science, marks the beginning of a new era in the study of consumption. Let us, then, compare the doctrine of consumption in Harvey's time with that of to-day.

FROM HIPPOCRATES TO THE SEVENTEENTH CENTURY.

In order to comprehend the state of opinion in Harvey's time we must retrace our steps to the time of Hippocrates, to whom we owe the first recorded account of consumption.

Hippocrates defines phthisis as suppuration and ulceration of the lung, and includes under the same head empyema, abscess of the lung, and gangrene. He speaks also of φυματα, swellings or growths in the lung, as causing phthisis. In Latin editions of his works these are translated "tubercula," hence, as Waldenburg points out, it has been thought that Hippocrates was acquainted with tubercles. But Virchow, after a critical examination of the passages in which φυματα are mentioned, came to the conclusion that these were circumscribed abscesses and not tubercles in the modern sense. These swellings are attributed by Hippocrates to collections of mucus or bile which suppurate, and are described as occurring also in the tonsils and in other parts.

The causes of consumption are pneumonia which fails to resolve in a critical manner, spitting of blood, and suppuration in the pleura. Pituitous secretion dropping down from the head and stagnating in the lung is another cause of suppuration and phthisis.

It is an eloquent testimony to the authority of Hippocrates that these views were adopted wholly or in part by every writer of note for the next 2000 years. Celsus added nothing to the account given by Hippocrates. Aretæus was the first to distinguish phthisis from empyema. Hear what he says:—

> "If an ulcer form in the lungs from an abscess or from a chronic cough or from the rejection of blood, and if the patient spit up pus, the disease is called Pyeor Phthisis. But if matter form in the chest or side or be brought up by the lungs the name is Empyema; but if in addition to these symptoms the lung contract an ulcer, being corroded by the pus passing through it, the disease no longer gets the name of Empyema, but takes that of Phthoe instead of it."

Aretæus makes no mention of φυματα or anything resembling tubercles in the lungs.

Galen in the main follows Hippocrates.

Phthisis is caused by ulceration of the lung. Ulcers of the lung are like ulcers of any other parts, and are due to direct injury, rupture and hæmorrhage from strain, and inflammation. Galen speaks of φυματα as inflammatory swellings resembling furuncles and buboes. One of the earliest references to contagion is believed to be found in these words:—

> "It is dangerous to live with consumptives and with those whose foul breath imparts a heavy odour to the rooms in which they lie."

Bulloch and Greenwood point out that Aristotle had expressed similar views concerning contagion.

The Arabian physicians closely followed Hippocrates and Galen, and made no further contribution to the subject. Phthisis remained an ulcer of the lung. The position was unchanged until the seventeenth century.

At this eventful period, when anatomical examination of the dead became more general, medical science began to burst its fetters, and a true renascence of medicine set in. The time which produced Harvey's great work on the Circulation witnessed other striking developments of medical knowledge, and this century constitutes one of the great epochs in the study of consumption. Among the writers of this time who dealt with this disease two men stand out pre-eminently, Franciscus Sylvius and Richard Morton.

Some account of the life and work of these two great men will, I hope, prove not uninteresting.

FRANCISCUS SYLVIUS (1614–1672).

Franciscus de le Boë Sylvius (not to be confounded with Jacobus Sylvius, who lived about one hundred years earlier) was born in 1614 at Hanau, in Germany.

His family was French, by name Du Bois or De le Boë, but his grandfather François, a Huguenot, had migrated to Germany to escape the religious persecutions of the time. The family had a distinguished military record, but owing to pecuniary losses François had embarked in commerce, for which Germany at that time offered favourable opportunities, having enjoyed peace for a considerable time. Isaac de le Boë, the son of François, married Anna de la Vignette, whose family came from Cambrai. Their son, afterwards known as Sylvius, was named François.

Lucas Schacht says that the boy's "beauty" of person, bodily activity, and gentle and virtuous disposition, inspired his father with the hope that such a body could only be inhabited by a lofty mind. His father determined, therefore, to give him a good education, and François was sent to Sedan to be instructed by learned and religious men in a Protestant school. Sedan, as Jelliffe points out, was one of the cities of refuge on the French border where Huguenots were tolerated.

The Medical Career of Sylvius.

When his schooling was completed he was given his choice of a profession: commerce, military science, or letters. He chose the last, and expressed a desire to study medicine. This decision met with his father's warm approval, and François returned to Sedan to study philosophy and medicine. After two years he went to Germany and the Netherlands to complete his education. At the age of 23 he was admitted Doctor of Medicine at Basle in 1637, and received authority to teach and practise medicine. After this time he assumed the Latin name of Sylvius. At his parents' desire he returned to practise at Hanau, his native town. But two years later he set out again to prosecute his studies in France and the Netherlands, finally settling at Leyden. Here he opened a school of anatomy and practised medicine with great success. His anatomical teaching became so celebrated that students were attracted to him from all parts. Anatomy and chemistry were the subjects to which he specially devoted himself. So great was his fame as a teacher of anatomy, says Lucas Schacht, that anyone who had not worked under him was thought to know little of the subject.

A few years later, to the surprise of his friends and to the grief of his pupils, he migrated to Amsterdam, when he was 27–28 years of age. Soon after his arrival he was appointed by the deacons of the Walloon Calvinistic Church to the care of their sick poor.

> "This charge," says Jelliffe, "without pay, gave him the public confidence, and at the same time facilitated his clinical researches."

The reputation which he brought with him from Leyden was speedily confirmed, and before long he obtained the chief practice in Amsterdam. He was beloved by the poor, whom he supplied gratuitously with costly drugs, many of them prepared with his own hand. His diligence, pity, civility, gentle manners, and sobriety commended him to all.

> "Who," says Schacht, "ever saw Sylvius drunk or disgraced by drink, a fault, alas! too common among medical men?"

In 1658 he was elected professor of medicine at Leyden, and for the next 14 years his activity in teaching, research, and clinical teaching was amazing. Opportunities for clinical teaching were provided by a small infirmary with 12 beds at Leyden, and these were very successfully developed by Sylvius. But Jelliffe shows that it is not correct to say, as some have done, that Sylvius was the first to give bedside instruction, for this method of teaching was originally employed at Padua in 1558, and had been imported into Leyden early in the seventeenth century, where it continued to be carried on for some years, though in a desultory fashion.

Sylvius had a most inspiring influence on his students; so many of whom achieved distinction afterwards that, in the words of Lucas Schacht—

> "The learned men that came from his school rivalled in numbers the crowd of warriors that sprang from the Trojan horse."

In 1668 his second wife and his only child succumbed to an epidemic fever, and Sylvius himself narrowly escaped the same fate in the following year. But on Nov. 14th, 1672, a second attack of the same disease carried him off in his fifty-eighth year. Jelliffe suggests that this epidemic disease was typhoid fever, but the fact that Sylvius had two attacks of the same nature in four years throws some doubt on this.

Sylvius's Contributions to Medicine.

Frank Baker, of Washington, in a very careful study of the anatomical works of Sylvius, comes to the conclusion that he was not the first to describe the Sylvian aqueduct, which was known to anatomists before his time or that of Jacobus Sylvius, who has also been credited with the same discovery. But from the evidence of his contemporary, Thomas Bartholinus, and of later writers, Franciscus Sylvius seems to have been the first to describe the Sylvian fissure.

Portal says that, though he worked much at anatomy, Sylvius made no great advance in this science. But Baker states that he invented a system of sections of the brain in different directions by which structures could be more effectively displayed. In addition he made examinations of lymphatic vessels, salivary glands, pancreas, and the spleen. He pointed out the difference between ductless glands, which he named conglobate, and acinous glands, called by him conglomerate. He believed that the ductless glands had a profound influence on the blood, and he thus may be said to have been in a sense a forerunner of modern views concerning internal secretions.

Portal points out that Sylvius had some knowledge of chemistry and its application to the human body. He was one of the early advocates of the fermentation of humours, which he applied to the explanation of secretions. He regarded the pancreatic juice as acid and the bile as alkaline; the contact of acid and alkali in the intestine gave rise to a new juice which preserved the balance between the acid and alkali. He was the author of numerous other explanations. With such principles, Portal says:—

> "He did little to advance the history of disease. His labours would have been more profitable if he had imported into his observation and experiments more of the scientific spirit, and if he had preferred description to ratiocination, which beguiles but often deceives us."

This criticism, though sound enough, seems rather severe when we remember the state of physiological knowledge at that time. But Portal, anxious to do him justice, adds in a subsequent passage that Sylvius was more instructed in mechanics than his predecessors, and described correctly the action of the diaphragm, proving that this muscle becomes flattened during inspiration and arched during expiration. He also admits that he made important observations on phthisis based on numerous autopsies. Further, to his credit it must be remembered that he was one of the first to repeat Harvey's experiments and to adopt his views on the circulation.

Eloy, after an adverse criticism of Sylvius's chemical theories, says of him:—

> "But he supported a better cause by defending with all his power the discovery of the circulation of the blood by the celebrated Harvey. Truth is sometimes regarded as a paradox by prejudiced minds, and this discovery, announced by the English physician in 1628, was still rejected as a chimerical fancy by most of the professors of Europe when Sylvius assumed the Chair of Medicine at Leyden in 1658.
>
> The proofs which he collected in favour of Harvey's discovery were so convincing that he had the glory of being the first to teach and demonstrate the truth of these views in the University of Leyden."

Lucas Schacht in his Funeral Oration says that Sylvius having convinced himself of the truth of Harvey's doctrine defended and advocated it publicly with such force that "one might doubt whether the greater honour and praise were due to Harvey, its author, or to Sylvius who first introduced it, published it abroad, and demonstrated its truth in this illustrious academy."

A glance at the medical works of Sylvius will show how wide was the range of his studies. There were few branches of medicine that he did not touch. Apart from his anatomical work, Sylvius has been chiefly known as the author of a purely chemical theory of disease which had little permanence. Nevertheless, these views possess a special interest at the present time, when the importance of physiological and pathological chemistry is so fully realised. But in his work on consumption he stands out as one of the

pioneers of the seventeenth century, and for this reason alone he would merit imperishable renown.

Views of Sylvius on Consumption.

The views of Sylvius on this subject do not appear to have attracted the attention which they deserve; I venture, therefore, to give a somewhat detailed account of them.

In his "Practice of Medicine" he introduces the subject by some general remarks on the nutrition of the lungs.

The lungs waste through the presence of pus, or of blood effused into their substance, or through some fault of their own. The fault lies in the blood when it suppurates, or when an abscess is formed in the course of pleurisy which conveys pus to the lungs either directly or through the blood. Whence not only are the lungs themselves wasted, but the whole body suffers also. The fault lies with the lungs when from any external or internal cause they become incapable of assimilating the blood brought to them, the usual internal cause being an ulcer, the external cause an empyema.

In phthisis not only are the lungs damaged, but the whole body is wasted, inasmuch as the blood is tainted by the intrusion of pus, which infects gradually all parts of the body and renders the processes of nutrition ineffective. The same results, both local and general, may be brought about by the blood containing morbid humours. In this case, whether from an excess of bile, pancreatic juice, or saliva, or from all three, from chyle or lymph vitiated in any way, from serum not being secreted in the kidney and remaining in the blood, or from many other causes affecting the blood, tubercles frequently originate in the lungs, together with textural changes in their soft and spongy tissues.

In the Appendix to his "Practice of Medicine," a posthumous work, he develops his views still further. Not every wasting of the body, but only that which follows an ulcer of the lung, is to be called phthisis.

In addition to the general wasting of the body, other peculiar symptoms are observed in phthisis—a cough and spitting of pus, together with a hectic fever.

Phthisis may be primary when pus is generated in the lung itself or secondary when pus is introduced into the lung from without, the pus infecting and tainting the lung and thus leading to ulceration.

The causes of primary disease of the lung leading to phthisis are numerous, the proximate one being a perforation of blood-vessels, whether by a wound, stab, blow, rupture, fall, shouting, coughing, straining, erosion by acrid humours, or by diapedesis, or exudation through distension or slackness of vessels, or in any other way. In a subsequent passage he says that the proximate cause of phthisis is a persistent ulcer of the lung associated with low fever and wasting. Among the causes of ulcer of the lung, the first place is given to peripneumonia passing into an abscess or vomica, the second to neglected spitting of blood. The other causes include acrid, salt, acid or pituitous humours dropping down from the head into the trachea and ulcerating the lungs, acrid pus penetrating the lungs from the chest walls or from an empyema. But when the aforesaid causes take effect on the lungs previously damaged in their natural constitution and inclined to phthisis, that disease is the more easily and rapidly induced.

"Seeing that experience shows that whole families are so disposed to consumption, that few of their members escape this fell disease, it may justly be asked in what does this phthisical constitution consist? It is notorious that the complaint is hereditary, and passes from parents to children, but the nature of this disposition is not so well understood."

In another passage referring to abnormal formations of the thorax, whether congenital or acquired, and to the hereditary disposition to phthisis, he says that in order to understand this we must believe that the individual humours of the human body change gradually from day to day, and with the progress of years undergo very considerable alterations, also that the solid tissues of the body, including the viscera, are subject to important changes at different age-periods. These changes are most conspicuous in the various glands, some of which wax, while others wane, from day to day. Thus the thymus gland, so large in the fœtus, shrinks greatly in adult life.

"A study of phthisis shows that the lungs possess a peculiar constitution which changes with age, although, so far, it is not possible to describe this accurately or to explain its nature. But this constitution must imply a special susceptibility to the influence of the humours predominating at any particular period of life. This disposition is to be attributed less to the solids than to the fluids of the body. In proportion as individual humours become more or more less acrid at different ages, a varying tendency to disease is manifested. The chief explanation of phthisis attacking persons otherwise in good health without obvious cause is to be looked for in the manifold changes which take place in the humours of the body."

In a subsequent passage he says:—

"I have often found two glands called thyroid lying close beside the trachea which have a certain affinity with the parenchyma of the testes. I suspect that from these a certain juice is poured into the trachea which if preternaturally acid would easily affect the lungs. Changes in this juice at different periods of life may lead to phthisis, especially where there is an hereditary taint."

After recounting the causes of phthisis, which for him means an ulcer or vomica in the lung, he breaks new ground in the following important passage:—

"I will now candidly state what I have observed and what, in my opinion, a vomica is. I have often seen glandular tubercles, both large and small, in the lungs which contained pus. These tubercles being gradually transformed into pus and enclosed in a delicate capsule must, in my opinion, be regarded as vomicæ, and I have frequently seen phthisis originate in these structures. I do not hesitate to ascribe to these tubercles the hereditary and deadly disposition to phthisis exhibited in certain families, for tubercles increase in size in the course of time and pass into suppuration. From my observations I have formed certain conjectures concerning glands which in the natural state are so small as to be invisible, but when diseased become enlarged, and are then seen scattered throughout the viscera and tissues of the body.

These views were suggested by:—

1. The glands of the choroid plexus invisible except in morbid conditions when they may reach a considerable size.
2. The pulmonary glands or glandular tubercles.
3. The glands seen in various parts of the body in the strumous or scrofulous constitution, these glands being of the conglobate variety."

"Inasmuch as we have seen that the small glands of the lungs may swell and become visible in disease and give rise to vomicæ, I suspect that an hereditary disposition to phthisis exists in these bodies."

"In addition to the causes already given, medical writers speak of contagion, the air expired by phthisical subjects being inspired through the mouth and nose of those around and infecting them with its acrid and fœtid miasma, with the result that they ultimately drift into a similar disease. And if we consult our experience and observe accurately what is apt to happen to the more delicate and younger blood relations in immediate contact with the disease, we find that this is only too true.

Wherefore physicians properly warn such persons and particularly close relations to avoid catching the breath of phthisical subjects. The special liability of relations is to be found in the small glands of the lungs invisible under ordinary conditions, but when occupied by a mere viscid humour growing to such a size that they can be seen and felt."

Advances made by Sylvius.

We see from a study of Sylvius's writings how greatly he was dominated by the influence of Hippocrates. "Phthisis sive ulcus pulmonum" is a phrase he uses more than once. Like all previous writers, he attributes phthisis in most cases to peripneumonia or pleurisy, ending in suppuration. But he makes a great advance when he states that tubercles are often seen in the lung in cases of consumption. Still more important is his discovery that tubercles soften and suppurate to form vomicæ. In his view tubercles were nothing more than enlarged glands which he supposed to exist in the lungs and other parts of the body, the enlargement being due to accumulation of viscid humours or secretions in these glands. The origin of the humours is referred to many causes acting for the most part through the blood, especially to excess of various secretions, such as bile, pancreatic juice, or saliva, also to changes in the thyroid secretion, which, as he supposed, found its way into the trachea.

In his conjectures concerning glands which in the natural state are so small as to be invisible, but when diseased become enlarged and are then seen scattered throughout the viscera and tissues of the body, it is not improbable that he is describing cases of generalised miliary tuberculosis. The assumed glandular origin of tubercles in the lungs suggested a relation to scrofula or struma in which external glands were enlarged. The action of heredity is exerted through these glandular tubercles.

Varying conditions of humours, or, as we should say, secretions, at different ages are credited with powerful predisposing influence in the causation of phthisis. May there not be some truth in this? The varying activity and mutual relations of internal secretions, about which, as yet, we possess little accurate knowledge, have profound effects on the human organism, and who shall say that susceptibility to tuberculosis is not in some degree connected with these influences? The phthisical constitution or disposition is also attributed to changes in the humours or secretions of the body.

It seems, then, from the many-sided activities of Sylvius and from his important work on consumption that Baker is justified in describing him as one of the great original thinkers of the seventeenth century, of the period that produced Harvey, Descartes, Leibnitz, and Malpighi.

RICHARD MORTON (*c.* 1635–1698).

Richard Morton was born about 1635, the son of Robert Morton, minister of Bewdley Chapel, in Worcestershire.

According to Copinger, he was born in Suffolk. But in the "Dictionary of National Biography" it is stated that he was baptised at Ribbesford, the parish to which Bewdley belonged, on July 30th, 1637. He matriculated at Magdalen Hall, Oxford, in 1653–54, but migrated to New College, where he subsequently became chaplain, proceeding to the degree of B.A. in 1656–57, and M.A. in 1659. After this he was chaplain to Philip Foley, of Prestwood, in Staffordshire, who appointed him to the living of Kinver, in the same county. Having refused to sign the Act of Uniformity at the Restoration, he was ejected from his living in 1662.

He then turned his attention to medicine. The next thing we hear of him is that he was admitted to the degree of Doctor of Medicine on the nomination of the Prince of Orange in 1670.

I have been unable to obtain any information about his life between 1662 when he was ejected from his living, and 1670, when he received his degree in Medicine at Oxford. The Rev. Claude Jenkins, librarian at Lambeth Palace Library, has very kindly examined the Archbishop's Register and Subscription Book there, but he has been unable to find any record of Morton having received a licence to practise medicine from the Archbishop. Wood says that he was admitted M.D. Oxford in 1670, in which year he accompanied the Prince of Orange to Oxford as physician to his person. Mr. Jenkins suggests that he may have come over from Holland with the Prince after studying medicine at Leyden or Utrecht. I have examined Peacock's Index to English-speaking students who have graduated at Leyden University and the Album Studiosorum Academiæ Rheno-Trajectinæ, but I cannot discover any mention of Richard Morton.

It is strange that nothing should be known about the medical education of a man who afterwards became so famous.

Bishop Burnet in his history tells us that the Prince of Orange came to England in the winter of 1669 in the twentieth year of his age, about a debt owed to his house by Charles the Second. Charles seems to have given the Prince many promises to pay, but little else. That the association between Morton and the Prince was of a satisfactory nature is evident from the fact that the latter after his accession to the throne of England as William the Third appointed Morton one of his physicians-in-ordinary.

After graduating in Medicine at Oxford, Morton came to London and was admitted a Fellow of this College in 1679. He was Censor in 1690, 1691, 1697. In 1680 he was incorporated at Cambridge on his Doctor's degree. He lived in Greyfriars' Court, Newgate-street, where he practised medicine with great success. He died in August, 1698, and was buried in Christ Church, Newgate-street.

Morton's Views on Consumption.

Richard Morton was the author of two works, "Pyretologia" and "Phthisiologia," of which the latter alone concerns us now. He defines a consumption of the lungs as

"An universal wasting of the parts of the body caused by some distemper of the lungs, as a stuffing, swelling inflammation and ex-ulceration of them, and thereupon it is attended with a cough, difficulty of breathing, and other symptoms of the breast, and accompanied with a fever, which at first is slow and hectical, afterwards inflammatory, and at last putrid and intermitting."

"The cause of a consumption of the lungs in general is a vitiated disposition of the mass of blood, and of the spirits of the nerves contracted gradually from several procatartic or predisposing causes in which the sharp or malignant serum or water of the blood being separated by the soft and glandulous substance of the lungs does stuff, inflame, and at length also ex-ulcerate the lungs themselves, which is the immediate cause of this distemper."

The procatartic or predisposing causes are numerous, and include stoppage of evacuations, passions of the mind, intemperance in eating and drinking, want of exercise, night studies and long watchings, sleeping in the day, an ill air, an hereditary disposition, an ill formation of the breast, infection, chalky stones and such-like in the lungs, or some preceding distemper.

The more immediate cause is a taking of cold. Speaking of infection he says:—

"This distemper, as I have observed by frequent experience, like a contagious fever does infect those that lie with the sick person with a certain taint."

"The degrees of this distemper are those which follow, to wit, first a stuffing of the lungs from the serum or water of the blood that is plentifully separated in them. Secondly, a hard swelling, but more especially in the glandulous parts of the lungs, arising from the same serum, distending those parts too much, and not having a free passage out of them: which tumour I take to be the crude tubercle mentioned by Galen; which tubercles, or crude and glandulous swellings I have often found in the dead bodies of consumptive persons, when the other parts of the lungs have been full of apostemes and ulcers. Thirdly, an inflammation of the lungs, arising from the heat and sharpness of this serum. And lastly, an imposthumation and ex-ulceration of these inflamed parts when the distemper comes once to its height and extremity."

Morton here clearly states his opinion that the formation of tubercles constitutes the first stage in the phthisical process. The origin of tubercles is treated as follows:—

"If anyone shall be inquisitive about the original of the tubercles in the lungs, I shall give this general answer: that the substance of the lungs not only seems more obnoxious to a flux of humours than any other part of the body from the continual motion of these parts caused in respiration, but also by reason of its spongy softness (because it consists wholly of small bladders and vessels) is wont to suck in and retain the humours. ..... When I consider with myself, how often in one year there is cause enough ministred for producing these swellings, even to those who are wont to observe the strictest rules of living, I cannot sufficiently admire that anyone, at least after he comes to the flower of his youth, can die without a touch of consumption.

And without doubt the breeding of these swellings is so frequent and common that a consumption of the lungs would necessarily be the common plague of mankind, if these swellings did not vanish, or were removed by art, as easily as they are bred at first; and indeed I have been used to think, not without reason, that as the more benign tubercles are wont to go off of their own accord, and that quickly, so none of them lay the foundation of the great disease of which I am treating, but only those which are in some degree malignant and ill-natured and that are wont to putrefy sooner or later from some peculiar quality of their nature."

Morton's belief in the great prevalence of tubercle and in the frequency with which spontaneous healing takes place has received striking confirmation in recent times.

"The crude tubercles resulting from obstruction of the glandulous parts of the lungs undergo a further change. Stagnation of the humours in these glands, caused by the thick glutinous quality of the juice secreted by the glands, leads to a transformation of the tubercle into a dry matter like suet or honey. Inflammation and suppuration follow. Pneumonia or pleurisy, if improperly treated, may end in consumption through the formation of tubercles and abscesses."

"Where a spitting of blood has preceded, a consumption of the lungs is wont to follow." But in this case, Morton says, "the consumption does not seem to have its original so much from the breaking or gaping of a small vessel as from the inordinate and hectical state of the blood."

When consumption follows hæmoptysis the lungs become stuffed with hard glandules or tubercles. "Chalky stones bred in the lung when they are sharp and angular," and other pointed foreign bodies such as nails or pins, may tear the lung and cause hæmoptysis, and thence ulcers in the lungs.

Morton distinguishes a special scrofulous variety of consumption in which—

"the blood by reason of its preternatural acrimony being, as it were coagulated, and so unable perfectly to unite the new chyle to itself and the solid parts, is wont to throw it in a larger quantity than is convenient upon the glandulous parts ..... and what happens in other glandulous parts happens also in the lungs themselves, which are everywhere full of innumerable glandules, but of some more conspicuous ones, upon the windpipe and the branches of it, though in their natural state they are not so easily discerned: so that 'tis no wonder if those that have the king's-evil, who are frequently subject to glandulous swellings in other parts, are likewise many times affected with such kind of tubercles even in the lungs themselves."

But, whether conscious or unconscious of a certain ambiguity in his description of this variety of the disease, he adds that the most certain diagnostic sign of this form "is to be taken from glandulous swellings in the external habit of the body accompanying of it, or at least preceding it." Morton says that this variety of phthisis was the commonest in his experience and furnished most cases of recovery.

Value of Morton's Work.

In estimating the value of Morton's work we must consider his relation to Sylvius, although he makes no reference to the writings of the latter. The Opera Medica of Sylvius were published ten years before the appearance of Morton's Phthisiologia, and it is unlikely that Morton was unacquainted with the older work, as the reputation and authority of Sylvius were then so great. Morton adopts Sylvius's view of the glandular origin of tubercles in the most thorough-going fashion, and follows him in other points. Sylvius, as we have seen, was far in advance of all previous authors in asserting that tubercles were often found in the lungs of consumptive persons, and in attributing the formation of vomicæ to the softening and suppuration of tubercles.

Morton went still further and maintained that tubercles were found in the lungs in all cases of consumption, whatever its origin might be. But in the seventeenth century the word tubercle was used in the etymological sense, and as yet possessed no specific pathological significance.

Both Sylvius and Morton insisted upon the contagious nature of this disease, a view which had long prevailed and seems to have been held by Galen and Aristotle.

(To be concluded.)

A GENERAL meeting of the Institute of Hygiene has decided to elect women to the governing body of the Institute.

THE STANDARDISATION OF THE WASSERMANN REACTION.

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WE may look at the Wassermann reaction from two standpoints—as a means for the diagnosis of syphilis and as a highly complex reaction involving the recognition of the presence, and if possible an estimation of the amount, of a hypothetical substance which occurs in the blood in syphilis and few other diseases. For the former purpose I see no reason to change my opinion that a method involving the use of crude serum is the best, and that its rapidity and freedom from certain possibilities of accidental error more than outweigh its disadvantages. This, however, is by the way. The so-called "original" method is now required officially, and I have now used for more than two years one of the recognised modifications of the test.

The Nature of the Problem.

I propose to discuss the theoretical basis which must underlie any attempt to bring about a standardisation of the process, so that an accurate measure may be made of the strength of the reaction in any given case, and so that the workers in different laboratories may get concordant results. There is a third problem intimately bound up with these two: What strength of reaction are we to regard as being necessary to diagnose syphilis? This cannot be solved until we have a standard by which we can compare our results.

In a Wassermann reaction which is just positive we may consider that the three reacting substances—syphilitic serum, complement, and antigen—are in a state of equilibrium. If we add a little more complement this remains free, but it can be absorbed by adding more serum or more antigen; if we add a little less antigen we can still get our positive reaction by using less complement, and so on indefinitely. We have to titrate our unknown substance, the strength of which we wish to determine, by means of two standard solutions, complement and antigen, the excess of either of which can be compensated for (within certain limits) by the corresponding excess of the other. Add to this the fact that in neither case can we standardise our reagents by ordinary chemical or physical processes, or obtain them in a state of purity, and it will be seen that the problem is one of extreme difficulty.

It is really even more difficult than this; for we test this absolute absorption of the complement by a test-reagent which is itself of extreme complexity, the mixture of red corpuscles and hæmolytic amboceptor. No two samples of red corpuscles are exactly alike; and even when we work with carefully preserved specimens of the same sample of blood we have no reason to know that this remains constant from day to day. Again, it is not easy to obtain exactly accurate emulsions of corpuscles, and I do not find that the point is gone into much in actual practice. The hæmolytic amboceptor, again, is a source of difficulty, in that it can only be standardised by the use of complement, which in turn can only be standardised by the use of amboceptor. We seem to have no starting point. And the strength of the test-fluid is not a matter of indifference. A reaction which appears positive when corpuscles sensitised with a small amount of hæmolytic amboceptor is used may appear negative when the latter ingredient of the test fluid is increased.

The Significance of the Reaction.

The question may be asked, How, in face of these facts, is it possible to get even reasonably trustworthy results in actual practice? And how is it that the results in one laboratory agree very fairly with those from another? The answer is that the Wassermann reaction varies enormously in strength, and that most reactions are so strong that they can be estimated by any technique. Thus, if we call the strength of the smallest reaction which we regard as positive 1, we often find reactions of 22, or somewhat more; and most of the cases that come to us to be diagnosed have a reaction of 4 or more, a strength which can hardly be missed. It is in the weak reactions that we get discrepancies, and it is the object of this paper to show a method, and, I believe, the only method, by which these discrepancies may be avoided.

It must be borne in mind that this is not altogether, and perhaps not mainly, a matter of technique or of ingredients; it is largely a matter of the personal equation of the experimenter. He has to deal with sera which, under the conditions of his test, will absorb all amounts of complement, from the smallest to the greatest. Some of these amounts, he knows, do not indicate syphilis; others equally certainly do—Where is he to draw the line? Thus, under the conditions in which I work I may get an absorption of complement which varies between 1 and 3000. (I am taking arbitrary figures.) An absorption of 5, or 10, or 20 I know does not indicate syphilis; it is a clear negative reaction. I am equally certain that an absorption of 100 does indicate syphilis; it is a clearly definite, though not very strong, positive reaction. What am I to say to an absorption of 75 or 80? Of course, the history of the case may give me some clue. If the serum is from a patient with a doubtful sore, or from a patient who has just finished a course of treatment, the diagnosis is obvious: I have to deal with a weak positive reaction. But where the history is not forthcoming I cannot possibly say what the significance of the result may be, nor can anyone help me.

There is no authoritative guide, nor can there be one until a large mass of experience has been accumulated, taking absolute units and not the arbitrary figures I have used above for sake of example. Under these circumstances every serologist is a law to himself. If he is naturally of a cautious disposition he pitches his standard low, so that he can never by any chance diagnose a case as syphilis if it is not so; by so doing he will sacrifice some accuracy, but he will never make the mistake (which is often so serious) of accusing a person of having syphilis when he has not. He will, however, miss a few early cases, and he will occasionally say that a patient is cured when he is not. The pathologist who is more daring will get more accurate results in these early or late cases, but he will run the risk of occasionally diagnosing syphilis when it is not present. These cases where the reaction is weak or doubtful make up but a small proportion of the total number examined, and the results of the two workers will coincide in the great majority of cases.

The first essential is for us to agree on some unit, some standard, to which all results can be compared. It does not follow that the unit shall be one that is used in actual practice, or that the methods which are used in obtaining this standard shall be used by all workers; indeed, I think it would be a great pity if any uniform technique were imposed and made compulsory. But what is essential is that he shall be able to compare his results with a standard—to say, for instance, that his four pluses corresponds to McIntosh and Fildes's 4 4 0 0 0 0, and so on. When this has been done we shall be able to take the further step and to investigate on a large scale where the line is to be drawn between the positive and the negative, for we shall have a solid basis of comparison. As a matter of fact, it would be a great advantage if we could have as our unit the exact minimum strength necessary for the diagnosis of syphilis, so that we could report a positive reaction of 1 or 2 or 20 units, and we should in doing so convey to the clinician a very clear and definite understanding as to the strength of the reaction. Moreover, if this were done he would be able to send serum to one laboratory at one time and to another subsequently, and get results which he could compare directly the one with the other. This is an ideal, but it is one that can be obtained without much difficulty.

Description of Technique.

I shall now describe the technique which I use in general work, and which I have followed in the investigations which I am about to describe. In general terms I follow McIntosh and Fildes's technique very closely, the alterations I use being mainly dictated by convenience.

1. *Preparation of the Hæmolytic System.*

Here I use a 5 per cent. emulsion of sheep's corpuscles, the amount being measured by sucking up the required quantity in a graduated pipette. I do not centrifugalise to constant volume in a graduated tube, since I find that the mass of corpuscles thus obtained is sometimes very difficult to stir into a uniform emulsion, and may show a considerable amount of hæmolysis when emulsified. Moreover, the matter is not really an important one so long as the deviation from the 5 per cent. aimed at is not great; the whole process, including the standardisation of the complement, is carried

out with the same emulsion, and any trifling error is unimportant. It is highly advisable to prepare all the sensitised emulsion that will be required for the day at once, otherwise a small error may creep in.

The question of the dose of amboceptor.—Here we have our first difficulty. We can only standardise our amboceptor by means of complement, and we cannot standardise our complement until the strength of the amboceptor is known. The term "unit of amboceptor" by itself is meaningless, for by altering our unit of complement we can, within certain limits, alter our unit of amboceptor. The usual method is to estimate the strength of the complement in presence of an excess of complement: thus, McIntosh and Fildes estimate their amboceptor in presence of a 50 per cent. dilution of guinea-pig's serum, and repeat the test so as to avoid getting abnormal results from the use of a weak serum.

I standardise my amboceptor in presence of the same amount of complement as is used in the test (2½ units per c.cm.) in the following manner: knowing from previous experience, or from testing out with a previously studied batch of amboceptor serum, the approximate amount of serum required to sensitise 20 c.cm. of 5 per cent. emulsion of corpuscles, I estimate the strength of my complement in the way McIntosh and Fildes describe—i.e., by taking a 1 in 25 dilution of the serum, measuring out 2/20, 3/20, 4/20, &c., of a c.cm. and making up to 1 c.cm. with saline. To these tubes are added ½ c.cm. of the sensitised emulsion and the mixtures are incubated for half an hour. If necessary a second estimation is made, using double amount of a 1 in 50 dilution. This gives a unit of complement in relation to the emulsion of corpuscles used in estimating it.

The new amboceptor is now in its turn estimated, using the same strength of complement as is used in the test proper—that is, 2½ units—as already determined. To do this a solution is prepared containing 5 units of complement in 1 c.cm., and a series of tubes put up each containing ½ c.cm. To these are added various dilutions of the amboceptor to be tested, and then ½ c.cm. of 5 per cent. emulsion of corpuscles, and the mixture incubated as before.

	c.cm.	c.cm.	c.cm.	c.cm.	c.cm.	c.cm.	c.cm.	c.cm
Complement*	0·5	0·5	0·5	0·5	0·5	0·5	0·5	0·5
Amboceptor†	1/100	1/1000	1/10,000	1/1200	1/1400	1/1600	1/1800	1/2000
Hæmolysis	Complete		Trace	Complete				Practically complete

* 2·5 units. † 0·5 c.cm.

Thus, each ½ c.cm. of amboceptor contains about 2000 hæmolytic units, or each c.cm. contains 4000 units—the units being estimated for 2½ units of complement per c.cm.

In actual practice I use 40 of these amboceptor units per c.cm. Where such a large excess is used small variations in the amount taken do not affect the result.

Where still greater accuracy is required the complement may be again standardised by means of the new unit of amboceptor thus obtained, and the latter re-standardised by means of the new unit of complement, and thus by a series of approximations very accurate figures may be obtained. It is necessary to emphasise the fact, however, that these are not fixed units, they are only relative the one to the other, and if it were necessary to make a complete fresh start there would be no means of getting the same standard as before. The saving point is the fact that the amboceptor serum varies but slowly, and owing to this fact the units used in any given laboratory maintaining a standard technique vary but slightly from time to time.

Having calculated the amount of amboceptor serum required, the necessary amount of corpuscles are placed in a graduate containing a little less than the required amount of saline, the serum is added and well stirred in, and the volume made up to the required total. Thus, to make 40 c.cm. take about 35 c.cm. of saline, add 2 c.cm. of corpuscles, 4/10 c.cm. of amboceptor (having the strength given above), and stir well; then make up to 40 c.cm. exactly. I prefer to begin work by preparing this mixture and letting it stand a little time before use, so that the corpuscles may get completely and uniformly sensitised. In hot weather it is a good plan to let it stand in cold water.

2. *Standardisation of the Complement.*

Prepare a 1 in 25 solution of the guinea-pig's serum, and place 2/20, 3/20, 4/20, &c., of this dilution in a series of tubes as before, make up to 1 c.cm. in all cases, and add ½ c.cm. of the sensitised emulsion. Incubate, and read off in half an hour, holding the tubes against a dark background and looking at them by transmitted light. This is the most difficult part of the process if really accurate results are required, though it is not easy to go so far wrong as to give results which shall have any incorrect clinical significance. Greater accuracy may be obtained by using a dilution of 1 in 50, and a useful device is to allow the tubes to settle for an hour or so, so as to be able to compare the upper part of the tube, which will now in any case be clear owing to the subsidence of the undissolved corpuscles, with the lower part, and thus to see whether there is or is not a trace of undissolved corpuscles. Another method is to centrifugalise and see whether there is a sediment, but this does not give exactly the same results as the former. Whichever method is used it must be kept to throughout.

3. *Preparation of the Antigen-complement Mixture.*

Here I deviate a little from McIntosh and Fildes's method, in that I make up my mixture so that the necessary 2½ units of complement and the requisite amount of antigen are dissolved in 0·9 c.cm. and not in 1 c.cm., as in their method. I do this simply because I use 0·1 c.cm. of serum for the test, and I get, in all cases, the volume of the fluid to be tested, whatever it may be, to 1 c.cm. exactly, this being the amount used in the standardisation. The calculation is made just as if I were going to make up the amounts in 1 c.cm., but they are actually dissolved in 9/10 of the amount. Thus, to make nominally 50 c.cm. of mixed antigen-complement, supposing the amount of antigen required to be 4 per cent. and the complement to have a minimal hæmolytic dose of 5/20 c.cm. of a 1 in 25 solution, I proceed as follows. The amount of guinea-pig serum required is—

$$5/20 \times 1/25 \times 2\tfrac{1}{2} \times 50 \text{ or } 1{\cdot}25 \text{ c.cm.}$$

(The amount necessary for 50 c.cm. can always be found by dividing the figure representing the number of twentieths of a c.cm. of the solution necessary for complete hæmolysis by 4.) Into a graduated measure I put about 40 c.cm. of saline, then add the antigen (2 c.cm.), and then 1·25 c.cm. guinea-pig serum, mix well, and make up to 45 c.cm. exactly. This gives me in each 0·9 c.cm. the amount McIntosh and Fildes put in 1 c.cm.

Two questions now arise for discussion.

(1) Is there any advantage in standardising the complement in presence of the antigen? I think there is only this advantage: that you are enabled to state at once, and without calculation, what is the actual amount of complement you are using in the test. Thus I find by repeated observations that the fluid prepared as above with the antigen I use, and calculated to contain 2½ units of complement per 0·9 c.cm., actually contains 2 units, and this is the amount used, therefore, in the test. This is shown as follows:—

A complement-antigen mixture containing 2½ (calculated) units of complement is tested for complement in the usual way: 7/20, 8/20, 9/20, &c., of the mixture are placed in tubes, made up to 1 c.cm. with saline, and ½ c.cm. of sensitised emulsion added. If there were no absorption of complement there would be complete hæmolysis in the 8/20 tube, whereas, as a matter of fact, it is not complete until tube 9/20, so that there are two free units of complement in each 0·9 c.cm.

I have thought it necessary to describe the method used for determining the anticomplementary power of the antigen (or what comes to the same thing if the complement is also estimated in saline), since some of the methods put forward are not, in my opinion, of any value. For any method to be useful the conditions must be exactly the same as in the test proper.

(2) Is there any advantage in mixing the complement and antigen (both prepared of double strength) just before the test, and not making up a large volume of the test-fluid for use throughout the series of test? I do not find that there is any continued absorption of complement for the first two hours at least after the two fluids are mixed. There is a very rapid absorption of the amount I have stated, but after that the composition of the fluid remains constant for a considerable time. Where I have wished to carry out a prolonged series of tests with the same mixture I have kept it in a jar of ice-water, but as a rule and for ordinary purposes no appreciable error will come in if it is kept for an hour or two at room temperature.

I may point out that in the actual practice of the Wassermann reaction there is no great object in making these

estimations in too refined a way or of attempting too great accuracy, since the amount of anticomplement varies in different sera, and unless this is estimated in each case the observer does not know how much complement remains for specific absorption, however carefully he may have standardised them in the first instance. For research work or for the preparation of standards it is another matter, and every precaution should be taken at every stage of the process.

4. *The Actual Test.*

I work with only half the amount, but for the sake of simplicity will describe the method as if the full 1 c.cm. was used. The preparation of the sera follows on usual lines and needs no comment. They are placed, each tube carefully numbered, in a tray of plasticine with a blank space at the left hand end. Into the row just in front of the row of a Wassermann rack in which the holes are numbered 1, 2, 3, &c., is placed a series of tubes into each of which 0·9 c.cm. of antigen-complement mixture is pipetted. The first serum tube is taken out of the plasticine and 0·1 c.cm. withdrawn by means of a fine-pointed capillary pipette. This is washed out into the mixture in the tube, which is then placed in the hole just behind it, numbered 1, and the serum tube is placed in the blank space at the left, so as to leave an empty space between it and tube 2. The pipette is then washed out with saline and the process repeated, so that each serum tube is gradually shifted one place to the left, and each complement-antigen tube is moved one row back. By this method I think I reduce to a minimum the possibility of mixing the tubes; and this, I am convinced, is one of the chief errors of the Wassermann reaction, and will continue so long as human nature remains fallible and large batches are in vogue.

When the rack is filled in it is placed at once in the water-bath and incubated for 20 minutes. Then ½ c.cm. of sensitised corpuscle emulsion is added to each tube brusquely, and the rack returned to the incubator.

No controls are put up in the first instance, since it is unnecessary in the case of a negative serum; the only purpose that can be achieved by a control is the detection of anticomplementary substances in the serum, and if full hæmolysis takes place these are not present in excessive amounts. Where there is a positive result, and especially a partial positive, controls are necessary. For these I use 1¼ or 1½ units of complement per c.cm. in saline, again making up the solution in 9/10 of the calculated amount. These amounts leave, as I shall show, approximately one free unit of complement when 0·9 c.cm. is mixed with 0·1 c.cm. of most sera, and should therefore give complete, or almost complete, hæmolysis.

5. *The Quantitative Test.*

This is carried out as follows. Taking a series of 6 tubes, I place 0·9 c.cm. of complement-antigen mixture in the first and 0·5 in each of the remainder. To the first tube I add 0·1 c.cm. of the serum to be tested; this is pipetted carefully to the bottom of the fluid, so that it does not mix therewith at present, and the pipette washed out in the supernatant fluid. Then, with a pipette showing 0·5 c.cm. I mix the two fluids quickly and remove 0·5 c.cm., which is immediately carried over into the second tube and mixed in. This operation is repeated until I come to the last tube, when the last ½ c.cm. is rejected. The whole process is very quickly carried out, and gives a series of six tubes containing 0·5 c.cm. of fluid each, the first containing 1/20 c.cm. of serum, the second 1/40, and so on to the last, which contains 1/640 c.cm. (These figures would have to be doubled to be comparable with the qualitative test, which was given as if carried out in 1 c.cm. of total bulk.) It is rarely necessary to go beyond the sixth tube, but exceptionally a specimen may be found which is even stronger than this and gives partial deviation when 1/640 c.cm. of serum is present in 1 c.cm. of complement-antigen mixture

The results are stated as in McIntosh and Fildes's method, calling complete inhibition (no hæmolysis), 4; nearly complete inhibition (a trace of hæmolysis), 3; hæmolysis of approximately half the corpuscles, 2; nearly complete hæmolysis, 1. Thus, a result stated as 444200 would indicate that 1/40 c.cm. of serum made up to 1 c.cm. with complement-antigen mixture would give complete inhibition, whilst a mixture of 1/80 c.cm. of serum made up to 1 c.cm. would leave enough complement free to hæmolyse about half the corpuscles.

We can, with no great degree of error, state our results in terms of the number of units of complement absorbed: thus, the result given above might be taken as indicating that 1/40 c.cm. of serum absorbed 2 units, or that 1 c.cm. would absorb 80 units. We may also read them off approximately in terms of "standard units": thus 400000 is equal to one unit, 440000 to 2, 444000 to 4, and so on. There are, however, some corrections which have to be made before regarding this as a scientifically accurate, though it is a fairly close, approximation. I will leave the question of these corrections for subsequent discussion; it is sufficient for my present purposes to explain the methods by which I have obtained the results I now have to quote.

Standardisation of Antigen.

Let us now revert to the main object of the inquiry, and see what fixed point we can find to act as a starting-point for the standardisation of our methods. The first and most obvious suggestion is the antigen. Would it not be practicable to have a standard antigen, issued by authority, which all workers might use, and thus obtain concordant results? Antigen is fairly constant (to say the least), and presents at any rate some approximation to a definite chemical substance.

The first question that arises is this: If we prepare antigens from similar materials by identical processes, will they be *equal, or approximately equal, in action*? I have carried out a good many experiments on these lines, and find that this is the case.[1]

For example, three antigens were prepared with 10 per cent. of sheep's heart in absolute alcohol (10 g. of heart-muscle with 90 c.cm. of absolute alcohol) and compared for their antigenic property. Mixtures were made of these three antigens with the same sample of 1 per cent. alcoholic cholesterin, and 4 per cent. dilutions were made with the necessary amount of complement, the same, of course, in all cases. Quantitative tests were then made with the same batch of syphilitic serum, and the results were found to be exactly the same; thus, in one experiment the serum (a very strong one) gave 4 4 4 4 4 3 0 with each sample of antigen, and when the seventh tube in each series (carefully selected so as to be of uniform width) was centrifugalised and the supernatant fluid compared with its fellows, no appreciable difference could be detected.[2]

These experiments have been frequently repeated, and as far as sheep's heart is concerned I have no doubt that an almost absolutely constant antigen can be prepared in this way. (I should say that I have always worked with fresh heart—not frozen—but that I have taken no especial care to see that it is equally fresh on all occasions.) There is one proviso: the solution of the active ingredient or ingredients is somewhat slow, and I find it takes at least a week for the antigen to get to its full strength, and it is better to leave it 10 days before use. I have made careful comparisons between two batches of antigen prepared from the same sheep's heart, the one part simply cut up into small pieces, the other minced fine and ground up with quartz sand, and then shaken for some hours: the latter attains its full strength more quickly, but the ultimate result is the same in the two.

In actual practice I use three extracts prepared from three hearts. They are kept separate, and I take 1 c.cm. of each, to which is added 2 c.cm. of cholesterin.

Secondly, as to the *keeping power* of the antigen. Strictly speaking, we cannot determine this, for we can only determine the antigenic power of an antigen by reference to a syphilitic serum, and we have as yet no assurance that this will remain sufficiently constant for our purpose. We can overcome the difficulty in this way: if we prepare several antigens at different times—say a month apart—and compare them from time to time, using them as antigens with syphilitic serum—any serum—then, if they remain constant, the results ought to be the same in all cases. This is what actually happens:—

Thus, antigen B was prepared on August 24th, 1917, and was therefore 1 month old at the time of the first test.

[1] This has already been stated by McIntosh and Fildes (Brain, vol. xxxvi., Part II.)

[2] The method by which the antigenic power of any antigen can be estimated in absolute units is deferred for subsequent publication.

Antigen C was prepared on Sept. 20th, 1917, and so was 4 days old. They were compared with serums X and Y on Sept. 24th, 1917. X gave 444442 with antigen B and 444442 with antigen C, but on a careful examination there was a minute trace of hæmolysis more in the last tube with antigen C; the amount was only just perceptible, and may have been due to the fact that full solution had not yet occurred. Y gave 444441 with antigen B and 444441 with antigen C. Here, again, the same minute difference could be detected on careful examination.

The test was repeated on Sept. 25th, with the same sera. X gave 444442 and 444442 with the two antigens, no difference being perceptible in the last tubes, and Y gave 444442 in both cases, there being a minute difference in the last tubes.

It was repeated again on Oct. 1st. Serum X gave 444442 with both antigens, but there was a minute difference in the last tubes; the same with Y.

The result of these preliminary experiments was to show that the antigenic power of the two antigens was practically identical, C being if anything a shade weaker than B, but the difference was extremely minute: it was hardly too large to be the result of experimental error, but it ran fairly constantly throughout the early part of the series, which was as a matter of fact larger than those I have published. Tests throughout November and December showed that both antigens had attained exactly the same strength.

They were tested again with other sera at intervals, and another antigen, D, was added to the series on Dec. 1st, 1917. This was found after a fortnight to have exactly the same strength as the other antigens, and on a standardisation on Jan. 15th all three antigens gave exactly the same readings with every serum with which they were tested, three in number. Thus, the last test (July 29th, 1918) was carried out with a comparatively weak serum, which gave 430000 with each antigen, and when the tubes showing partial hæmolysis were centrifugalised and compared, not the minutest difference could be seen between them.

Thus we find that three antigens prepared by identical methods from similar materials gave identical results when tested for their antigenic power within a fortnight after being made, and at intervals of 10 months in the case of two of them and 7 months for the other. I may say that the anticomplementary power (which is much less important) was also tested, and was found to be constant.

Now, of course, it is possible that all these antigens were altering exactly uniformly, and that when each began it happened by chance to be of just the same strength as had been reached by the preceding in their process of deterioration, but this was unthinkable. The only probable explanation, which I have no doubt is the correct one, is that antigen is a stable substance, and shows no falling off in strength in ten months at least.

There is one point on which I must lay emphasis, since in this my practice differs from that in use by most serologists. I always keep my antigen on the magma of heart from which it has been extracted. I have had sudden changes on many occasions in antigens which had been pipetted or filtered from the deposit, but, as I have said before, never in one that has been kept in contact therewith. I suggest that the substance or substances which act as antigens are sparingly soluble in alcohol, so that they form a saturated solution under the conditions of the experiment. If the stopper is kept out of the bottle, some of this active substance is thrown down; or if a little alcohol gains access when the pipette, wet with alcohol, is inserted, a little more is taken up. (Of course, no one would pipette up his antigen with a pipette wet with water.)

This fact appears to constitute an excellent starting-point for the standardisation of the Wassermann reaction; and so, within limits, it is. It will enable us to fix a constant unit for the reaction, one which can be reproduced at any time by anyone if the official standard is lost. I should suggest as a tentative unit *the strength of serum which will just give complete absorption of two units of complement when 1/10 c.cm. of the serum is incubated with 9/10 c.cm. of 4 per cent. antigen, prepared in the way I have described.* This is an excellent clinical standard. I have had experience of its use in some thousands of cases, and with one or two exceptions (in none of which could the presence of syphilis be excluded absolutely) I have never found a positive reaction, using this standard, in a non-syphilitic case. Whether it can be made a little delicate say by lowering the amount of complement to 1·75 or 1·5) remains for future investigation.

But further consideration will show that the use of a standard antigen, though of great value, does not help us very much when we have to deal with serologists all over the country making Wassermann tests by very different methods. For if a worker uses the antigen in different strengths or in different proportions he will have to test out this standard antigen for himself, and he might just as well make it in the first instance. Again, it does not meet the indication of providing a fixed unit to which all results, by whatever method they are obtained, can be compared. For instance, a standard antigen such as I have described would be quite useless to anyone following Browning's technique, and any results obtained by him would still remain a sealed book to anyone who was used to other processes.

Standardisation of Serum.

We turn, therefore, to the third ingredient of the first stage of the reaction—the serum. If it were possible to prepare a standard serum of constant strength the problem would be solved. This would be of use in two ways.

In the first place, by using it as a control, worked out quantitatively in every batch of tests, it would be obvious if at any time the conditions altered and the results were not in series with those that had gone before. For example, if the standard serum gave a reaction of 444000 on previous occasions, and then gave only 440000, it would be obvious that something was wrong—probably either the complement had been estimated too high or the antigen had lost potency. The experimenter might then either recalculate his results on this basis or, preferably, scrap them and test them out again. I now use a standard control serum constantly for this purpose.

In the second place, the serum could be used for any method of testing and the results stated in absolute units. For example, suppose we take the unit I have suggested provisionally, and we have to deal with a serum giving 444000. This will be of about 4 units strength, since each 4 represents a serum of half the strength of its left-hand neighbour. When the serum is tested quantitatively by another method it might give a result which the experimenter might choose to express by saying that under the conditions of his experiment it had absorbed 12 units of complement. In this case each of his units would be equivalent to 3 standard units, and might be so expressed, so that his report would read "positive, absorbing 12 units of complement, equal to 4 standard units." I need hardly say that it would not follow that all his results need be worked out fully quantitatively. As a check on his method and to see whether his positives and negatives came out correctly it would only be necessary to do one full quantitative test—that one the control serum.

I believe this is quite practicable, indeed quite easy of accomplishment.

Constancy of the Serum.

The first question that presents itself is this: Does the serum remain constant for a length of time sufficiently long to allow it to be used in this way in practice? I shall show that it does.

The sera used in these observations were collected from syphilitics as a part of the intravenous injection of salvarsan products, and the greatest care was used in securing absolute asepsis. The specimens were collected in test-tubes (the angled tubes described in THE LANCET[3] were found to be of the greatest value in securing a full crop of serum), and after complete separation had occurred the serum was pipetted into a second tube until complete subsidence of the corpuscles had taken place or it was centrifugalised. It was then pipetted into sterile glass ampoules, white for choice, and the tips sealed, care being taken that no serum remained in the tip to become charred during the sealing. It was then heated to 58° C. for 15 minutes.

The first series of experiments dealt with samples of the same batch of sera kept: (1) at the room temperature, (2) in the ice-chest, and (3) frozen solid in ice and salt. Two sera, both from untreated secondary cases, were used, and each was tested with two antigens. One serum (176) gave 444420 with each antigen and the other (180) gave 444442. (There was a minute difference between the results with the same serum and the two antigens, due to the latter not being of exactly the same strength; this was very small, and apart from it all the readings were identical within the limits of experimental error.) This was on Sept. 21st, 1917, the sera having been collected on Sept. 18th and Sept. 20th respec-

[3] THE LANCET, 1917, i., 597.

tively. They were re-tested with the same results on Sept. 25th, Oct. 1st, and Oct. 16th. The experiment had then to be discontinued, owing to the stock of serum running low.

This experiment showed clearly enough that the change, if it took place at all, was very slow, and, further, that there is no advantage in keeping the serum in the ice-chest, or frozen, at any rate for a period up to three or four weeks. This is a great practical advantage. Of course, it may be suggested that the serum got weaker, but that the antigen altered simultaneously and *pari passu* with it. To assume this we should have to believe that eight substances (the two antigens and the six specimens of serum) all altered at exactly the same rate; this is extremely improbable, and the only tenable explanation is that all the specimens, antigen and serum, remained constant throughout the experiment.

This has since been abundantly confirmed, and I have now ample evidence that syphilitic serum, collected aseptically and free from corpuscles, will keep for at least a month without appreciable alteration. If kept indefinitely it does fall off gradually, and I am now investigating, as occasion arises, the speed at which it does so. Such experiments are naturally slow, and I have at present no figures to quote, but I may give the following figures of five sera which have been kept for considerable periods of time.

	207	208	209	212	233
Dec. 12	444420	443000	442000	430000	—
Dec. 19	444420	442000	441000	420000	—
Jan. 4	444430	442000	442000	430000	—
Jan. 11	444430	442000	442000	430000	443000
Jan. 18	444430	442000	442000	430000	443000
Jan. 29	444420	443000	442000	420000	442000
Feb. 5	444430	443000	443000	100000	441000
Mar. 19	444430	443000	442000	100000	441000

These observations, I may say, were carried out without any extraordinary precautions as to accuracy, as a part of the routine Wassermann examinations, which may account for the occasional discrepancy in the last significant figures. Here it will be seen that serum 212 (which was a weak one to start with) fell off nearly to nothing during the experiment, whilst the others remained practically constant. I may point out that a falling off of from 444440 to 444400 represents a diminution eight times as great as one from 440000 to 400000. I should also like to point out that I have seen in one serum at least indications of a decided rise after it had been kept for a long time. The subject teems with questions for further investigation, but for the present I will content myself with stating that Wassermann sera do not alter appreciably in strength for a month. I believe I am well within the mark.

The Question of Anticomplement.

Serologists to whom I have quoted my figures have objected that they were obviously impossible, since the serum *must* get stronger from the development of anti-complement. I need hardly point out that the usual teaching is that serum begins to get anticomplementary within a few days after collection, and that this property of bringing about non-specific destruction of the complement vitiates any results obtained except with fresh serum; the anti-complementary power, it is stated, can be destroyed by a fresh heating to 55° or 60° C.

I find myself quite unable to agree to either of these propositions, and I do not remember to have seen any detailed figures on which they are based. My experience is (1) that sera collected aseptically and free from corpuscles are never anticomplementary to an extent sufficient to nullify the Wassermann reaction when carried out as I have described above; and (2) sera kept aseptically either do not alter at all in their anticomplementary power, or, if they do so at all, only to an insignificant extent, and one hardly beyond the range of experimental error. To give the data on which these statements are based I must give my technique. There are two methods.

(1) Having tested out the complement in the usual way, prepare a dilution of such a strength that there is ½ unit in 0·9 c.cm.; it may be necessary also to use a solution containing 1 unit in 0·9 c.cm. if very strong anticomplementary sera are in question. To 0·9 of one of these solutions add 0·1 of the serum to be tested, mix and incubate for 20 minutes; then add ½ c.cm. of the emulsion of sensitised corpuscles and incubate until hæmolysis has gone on as far as it will. The process is slow, and about three-quarters of an hour is necessary. Prepare a series of tubes showing the effect of various fractions of a unit of complement thus: prepare first a solution containing 1 unit of complement per c.cm.; into a series of tubes put 1/20, 2/20, 3/20, &c., of this solution and make up to 1 c.cm.; add ½ c.cm. sensitised emulsion and incubate. When hæmolysis ceases centrifugalise the tubes; the clear solution will show the amount of hæmolysis given by 0·05, 0·1, 0·15, &c., of complement. Compare the hæmolysis in the tube to which serum has been added; the difference will show the amount that has been absorbed. Thus, if 0·1 c.cm. were added to 0·5 unit of complement and the resulting hæmolysis was equal to 0·2 unit, it follows that the serum absorbed 0·3 unit. The advantage of this method is that it requires only one tube for each serum to be examined, and when a series is to be tested it is very convenient. It is useless for sera showing hæmolysis.

(2) In the second method a series of solutions containing 1·125, 1·25, 1·375, 1·5, &c., units of complement per 0·9 c.cm. are prepared, and to each 0·1 c.cm. of serum is added. The mixture is incubated and the corpuscles are added in the usual way, and the point at which complete hæmolysis takes place is read off. This, less unity, gives the anti-complementary power of the serum. This method is rather wasteful in serum, but it gets rid of the troublesome process of preparing the standards, and it can be carried out with tinted serum.

Whichever method is applied the results are substantially similar, and the usual strength of a serum is about 0·25; that is to say, under the conditions of the Wassermann reaction about 0·25 of a unit is absorbed in the first tube by non-specific absorption by the serum. Very rarely the amount exceeds 0·5, but I have never found it as high as 0·75. Now, I may point out that in the Wassermann technique which I have described there are two free complementary units to start with, so that if a whole unit is absorbed non-specifically there will still be complete hæmolysis and a negative reaction if there is no specific absorbing substance present. I have never found it anything like that amount; I am speaking, of course, of reasonably clear sera. But it must also be borne in mind that in a strong serum the anticomplementary action is reduced by dilution until it is inappreciable. Thus if the anticomplement were 0·5 in the first tube it would be reduced to 0·00625 in the fourth tube.

As regards the alleged increase in the anticomplement on keeping, I can only say that I have examined sera of all ages up to seven months, and have never found it to occur. Sometimes I have thought there was a very slight rise, but, as a rule, it keeps reasonably steady within the limits of experimental error; certainly I have never seen anything that would throw out the test. I ought to say that my test sera are heated to 55° for half an hour, or to 58° for a quarter of an hour once for all when they are potted off, and are not heated subsequently. I prefer white bulbs, as any turbidity due to bacterial growth would be visible. The bulbs are kept in the dark, at room temperature.

Absorption of Complement.

A few words are necessary with regard to the assertion that complement varies in regard to the degree with which it is absorbed by antigen in the presence of syphilitic serum. I have never found this to occur, although I have been carrying out the technique I have described above twice a week at least for the last two and a half years, and must have had experience of at least 250 complementary sera; and I may point out that in the tables of the strengths of sera on different occasions given above it is obvious that it did not occur, or such constant results could not have been obtained. It is proverbially difficult to prove a negative, and if a hundred complementary sera were investigated and showed constant results with the same syphilitic serum and antigen it would be open to anyone to argue that the hundred and first would have shown something entirely different. But if this variability actually occurs two results follow: (1) it will be impossible ever to constitute an absolute Wassermann unit, and (2) the comparative method which I suggest by the use of standard sera will be additionally useful.

My complement serum is always used the same day, in fact as soon as it has separated. Rarely it is used on the second day as well, and I find it gives exactly the same results on the second day as on the first with the same serum and the same antigen, although the strength may have fallen off very decidedly.

Method of Testing Strength of a Standard Serum.

I will now give in brief outline the method of testing the strength of a standard serum so as to get absolute results. An actual example may be of interest.

Complement tested. Unit found to be 10/20 × 1/50, or 0·01 c.cm.

Antigen-complement mixture prepared by adding 1 c.cm. of antigen to about 20 c.cm. of saline, then adding 10/20 × 1/50 × 5/2 × 25, or 5/8 c.cm., of complement serum, and making up to 22½ c.cm.

This mixture had added to it 2½ units of complement per c.cm. To test the amount actually present 7/20, 8/20, 9/20, and 10/20 c.cm. were placed in tubes, made up to 1 c.cm. and ½ c.cm. sensitised emulsion added. The first two tubes showed slight haziness, the last two were clear, indicating that 9/20 c.cm. contained one unit, or 0·9 c.cm. two units, the amount required. (I may say that I am not certain that there is not a slight error here, tubes containing antigen not being easy to read off for complete hæmolysis; the error, if it occurs, is quite trivial.)

First approximation. The serum was tested by the technique already described, and found to give a reaction of 420000. Thus, 0·1 c.cm. of undiluted serum gave a complete reaction under the conditions of the experiment, whilst the same amount of a 1 in 2 dilution did not.

Second approximation. Dilutions of the serum of 1 in 1¼, 1 in 1½, and 1 in 1¾, were prepared. The first and second gave no hæmolysis, the last a trace of hæmolysis.

Third approximation. A dilution of 1 in 1⅝ was prepared. It gave no hæmolysis.

Lastly, the anticomplementary power of the serum was tested and found to be 0·125.

Thus the serum contains 1·625 units of reacting substance. If I were issuing this as a standard serum I should issue it as giving a complete reaction at 1 in 1¼, a partial one at 1 in 2, and no reaction at 1 in 3; and these figures, I believe, would hold whatever technique were used. Such sera should be issued periodically by authority. If any experimenters would like to have them, in order to be able to compare their units with my own, I shall be pleased to send them to them on a small scale as opportunities allow.

Conclusions.

In this paper, therefore, I have attempted to show:—

1. That it is possible to prepare a standard Wassermann unit by the use of antigen prepared in a definite manner. I suggest that until further experience is obtained the absorption of two clear units of complement, tested in the manner described, shall be regarded as a standard unit, this being found to give good clinical results.

2. That antigen prepared in the manner described remains remarkably constant, and that if several specimens are prepared from different batches of similar ingredients, they will give constant results.

3. That syphilitic sera, prepared aseptically and free from foreign materials, remain constant for at least a month, and probably for much longer, at room temperature.

4. That the use of such sera affords an easy means by which any experimenter can obtain comparable results from time to time.

5. That the use of such sera, accurately standardised, will enable workers by any technique to obtain results which are comparable.

6. I suggest that the Wassermann reaction should be reported in terms of Wassermann units, either those which I have described or some modification thereof, the figures given by each laboratory being the same whatever the technique, and such as will indicate the number of times the serum is stronger than the weakest serum which will just give definite proof that the patient has syphilis.

TUBERCULOSIS SOCIETY.—Sir Malcolm Morris will open the winter session with an introductory address on "Past and Future of the Fight against Tuberculosis" on Monday, Oct. 28th, at 8 P.M. The meeting will be held at the House of the Royal Society of Medicine, 1, Wimpole-street, London, W., and is open to all practitioners of medicine.

A MATINÉE of one-act plays will be given at the New Middlesex Theatre, Drury-lane, London, W.C., on Friday, Nov. 8th, at 2 P.M., in aid of the Vanguard Farm for Disabled Soldiers and Sailors at Sutton Valence, Kent. Tickets may be obtained from Miss H. M. Ironside, 50, Lincoln's Inn-fields, London, W.C. 2.

A NEW TECHNIQUE OF HEART MASSAGE,

WITH A CASE OF RESUSCITATION.

BY T. C. BOST, M.D. WASHINGTON, D.C.,
TEMPORARY CAPTAIN, R.A.M.C.

With Remarks by A. NEVE, F.R.C.S.E.,
TEMPORARY MAJOR, R.A.M.C.; SURGICAL DIVISIONAL OFFICER, WAR HOSPITAL, DARTFORD.

IN reviewing the literature of heart massage we find that this procedure has repeatedly been done, and in many instances with complete success; but in the career of any one surgeon, however long it may be, the opportunity will present itself but once or twice, if at all.

The first reported case was not until 1898 and the first reported complete success was as late as 1902 by Starling and Lane, so that even now from a clinical point of view heart massage may be considered of fairly recent origin and application. Green[1] in 1906 reviewed the literature and gave an abstract of 40 published cases. Many cases have since been reported, but from the leading medical journals of many countries it would be difficult to collect more than ten successful cases in the last ten years.

Early Operation.

Judging by the reported cases complete success depends upon prompt operation, only 6 to 8 minutes after heart stoppage. Mollison's case[2] made a good recovery after an interval of 13 minutes, but showed profound mental symptoms for several days. In view of modern physiological science and surgical skill, all will agree that heart massage should be done in cases of suspended heart action following an anæsthetic, which have failed to respond to the ordinary methods of resuscitation, and as these methods are in many cases of doubtful value they should not be relied upon. Schiff as early as 1874 demonstrated, by chloroforming dogs until the heart ceased to beat, that artificial respiration and stimulation by electricity were of no avail in restoring cardiac action, but that massage, directly applied, restored it after an interval as long as 11¼ minutes; furthermore, that the shorter the interval of time that elapses before applying massage the higher the percentage of success.

The Methods Employed.

There has been a gradual evolution of methods of heart massage.

1. *The thoracic method.*—In this a flap consisting of the thoracic wall over the cardiac area is cut and turned back, the base being either inwards or outwards. The costal cartilages are cut through, the pericardium exposed, and sometimes opened. The proceeding is forcible and must accentuate shock. Many intercostal vessels and nerves are involved. Pneumothorax has occurred in several of the published cases, and it is not surprising that the successes were almost nil, and that the method has been abandoned.

2. *The abdominal route, subdiaphragmatic.*—It is a familiar fact that some pressure upon the heart can be effected from the abdominal side of the diaphragm, so it was a natural thought to apply such pressure when the heart's action was arrested during the progress of a laparotomy operation. When promptly applied the conditions were favourable to resuscitation (Gray, 1902; Igelsrud, 1904; Cohen, 1903; Sencert, 1905; Depage, 1905; Smith and Daglish, 1905; Ramsay, 1906). This method has probably been used at an early stage in many unpublished cases, and the promptitude has won success. It is also possible that some of these cases might have recovered without massage. It has been demonstrated that in a child whose thorax is small and tissues elastic compression is possible though difficult; but in the adult it would rarely be effective, as only the cardiac apex can be reached, and it slips away upward. Hence the need for the trans-diaphragmatic method to reach the base of the heart where the auriculo-ventricular nerve ganglia are situated.

Heart massage is a complex performance. In its lightest rhythmical form it may undoubtedly stimulate the cardiac nerves, but a gentle squeeze of the organ does more: it empties the blood from the flaccid, perhaps distended auricles into the ventricles, the blood current acts as the physiological stimulus to these, and then the coronary arteries supply fresh blood to the cardiac muscles; thus a

healthy circle is re-established, and is reinforced by the artificial respiration, which should be carried on the whole time.

3. The *trans-diaphragmatic abdominal* route has been several times adopted, probably only unsuccessfully because too late. It need not be condemned on the statistics hitherto available. As above pointed out, the successful cases of subdiaphragmatic massage were those in which an abdominal operation was being performed at the time of the heart failure. It was the facility and the promptitude which secured the success. The diaphragm was only incised in the late stages of the worst cases, as, for example, Green's second case, in which an hour after apparent death from diphtheritic syncope he incised the pericardium through the diaphragm, and by massage started a few contractions. What more could have been expected? or Mauclaire's cases after tracheotomy and other measures carried out for 30 minutes?

The trans-diaphragmatic incision seems in these cases to have been approximately antero-posterior, splitting the muscle fibres and gaining direct access to the pericardium. There is some difficulty in executing this manœuvre on account of the left lobe of the liver and the stomach; there is also some risk of injuring the musculo-phrenic artery and having concealed hæmorrhage; and the suturing of the opening in the pericardium and diaphragm is as difficult as it is also necessary.

Hence the advantage of the horizontal incision behind the left costal margin which we here describe.

Description of the New Technique.

The abdominal incision is made four inches long in the median line, extending from above the umbilicus well up into the xipho-sternal notch. The left costal cartilages are well retracted, bringing the anterior diaphragmatic insertion well into view. There should be a pillow under the waist. A two-inch incision, beginning one inch to the left of the median line, carried outwards behind the costal margin, cuts the fibres of the diaphragm near their insertion. A blunt instrument pushed in opens the pleural cavity, and the opening is rapidly dilated with two or three fingers of the right hand, so that the whole hand can then be passed into the thoracic cavity anterior to the pericardium. The hand is passed upward, the thumb behind the sternum and the fingers embracing the entire organ in the pericardium. The thumb compresses the right auricle and ventricle, and the base of the heart is effectively massaged. No vessels are injured in this incision, as the superior epigastric artery is internal to the incision and passes into the rectus muscle, and the musculo-phrenic branch enters the diaphragm through the cellular tissue behind the eighth or ninth costal cartilages and passes backwards, deeper than the incision. The liver and stomach, even if prominent, offer no obstruction to this route, nor is the pericardium in risk of being opened. During the massage the parts can be pressed round the wrist of the operator so that air is not sucked in, and there is no tendency to collapse of the lung.

Closure.—The incision is easily closed and made air-tight. The costal margin is retracted and the cut diaphragm pressed up while a continuous catgut suture is inserted by means of a strong curved needle and holder. While this is being done the assistant can make rhythmic pressure during inspiration relaxed during expiration so that any contained air may be expelled and no more be allowed to enter. The abdominal wound is then closed in the usual way.

Abstract of a Case.

Pte. M. P., aged 37, was severely wounded on Oct. 26th, 1917, both knee-joints being involved. There were prolonged treatment and several operations. By March, 1918, both knees were healed, the left knee ankylosed, and he was allowed up. A week later some vague shifting abdominal pains began to appear, with tenderness and some rigidity, first on right flank then on left, and an irregular temperature. He also had a cough. Diarrhœa alternated with constipation. A week later he had retention of urine, and the orderly officer passed a catheter; there was some pyuria and diminished quantity of urine. No casts were found. He was thin and losing ground, with a blood pressure of 155 mm. and leucocyte count 12,000. In consultation it was decided to perform laparotomy to determine the presence of any abdominal abscess, and the condition of the kidneys, some metastatic sepsis being suspected.

Operation.—On March 30th, after a preliminary hypodermic of atropine 1/100 gr. and morphia 1/6th, chloroform was slowly and carefully administered by the open method by an experienced anæsthetist.

Time-table.—11.45: Began anæsthetic. 11.55: Almost under. Anæsthetist asked the surgeon to wait a minute as the patient was not yet fully relaxed. 11.58: Respiration ceased, pupils dilated, and colour changed to waxy. No pulse could be felt. Artificial respiration at once begun, with rhythmical traction of his tongue, and head of table lowered. 12.0: Strychnine and ether hypodermically. Auscultated, no heart sounds. 12.10: Artificial respiration pumps air well into chest, but nothing spontaneous. Eyes staring open, pupils dilated and insensitive. Captain Bost made a 4-inch epigastric incision, passed his gloved hand in, and pressed on the heart through the diaphragm. The heart felt quite flaccid and slipped upwards so that only the apex could be pressed, and there was no response. 12.15 Artificial respiration continued, and some rhythmical heart pressure first by Captain Bost, then by Major Neve. 12.20: The case appeared hopeless, but Captain Bost proposed to insert his hand into the thorax, and did so, incising the diaphragm as described above; he passed his hand up under the sternum, outside the pericardium to the base of the heart, which he could then completely grasp, and began slow pressure. 12.25: At first the organ was completely flaccid; after perhaps 12 seconds a sort of muscular twitch was felt, followed by a very feeble contraction, which in a few more seconds became strong and regular. 12.30: Pulse felt, colour returned, and massage stopped; injected pituitrin; artificial respiration continued. The diaphragm was sutured. A rapid exploration of the abdomen was made by Major A. Neve. There was some free clear fluid and no pus nor any inflammatory adhesions. The kidneys felt large. The wound was sutured and dressings applied. 12.45: Bandaging completed. Breathing slowly. Strong visible cardiac pulsation. 1.15: Back in ward. Blood pressure 145 mm. 1.30: Continuous proctoclysis was begun. He lay comatose.

March 31st: Still in same state, pupils medium size, sluggish. April 1st: Still same state; has had no convulsions. Has slight emphysema over left chest. Takes only 1 or 2 ounces of peptonised milk at the time, as he swallows badly. Pulse still strong and rapid. April 2nd: Emphysema had disappeared. He is more comatose. Died at 5.30 P.M., 77 hours after the operation.

Post-mortem (April 3rd).—The laparotomy wound was well closed and quite clean; also the incision in the diaphragm, which was quite air-tight. There was no pneumothorax and the chest looked healthy except some septic metastatic foci at the base of both lungs. The pericardium and heart looked healthy. Both kidneys showed small calculi and pyelo-nephrosis. The left ureter was partly blocked by the pus and gravel at the bladder orifice.

REMARKS BY MAJOR NEVE.

The striking success of Captain Bost's procedure in this case as regards the resuscitation of the heart's action after 25 minutes' absolute cessation proves the value of efficient heart massage. Without that the man was already dead. It was clear to all the five surgeons who were present that we were dealing with a case of primary heart failure under chloroform narcosis, due to the toxæmia of the patient's disease.

We could carry on the respiration without his muscles, but not the circulation. Subdiaphragmatic massage was inefficient, because it did not stimulate the cardiac nerve ganglia at the base; but after incising the diaphragm and grasping the base of the heart, 10 or 12 gentle squeezes started regular contractions, and the strong apex beat became visible to all onlookers. We have discussed the technique elsewhere. The incision was one which Captain Bost had previously planned on a cadaver.

It is unfortunate that this method was not adopted a few minutes earlier, as the prolonged pause in the cerebral circulation was probably in part responsible for the onset of coma; but had the kidneys and lungs been healthy the patient might well have recovered.

Conclusions.

1. We consider that this case illustrates the unique value of heart massage, and that the human heart can be resuscitated after a variable length of time—in this instance after 25 minutes. Nothing else could have re-started the cardiac action in this case.

2. *Type of cases for massage.*—All cases of suspended heart action following an anæsthetic, regardless of theoretical etiological factors, after a certain interval. Cases of asphyxia should also fall within this group.

3. *Length of interval.*—This should probably vary with individual cases, but should rarely be done under five minutes (unless the abdomen be already open), and certainly after eight minutes, though a longer interval need not bar the operation. The simpler methods of resuscitation, such as artificial respiration, tongue traction, sharp percussion over the cardiac region, and inversion of the patient, should begin in the first minute, but not be uselessly persevered in to the neglect of more efficient measures.

4. Subdiaphragmatic massage may suffice, especially in children, and if very promptly undertaken. But if only the apex is reached and the heart remains unresponsive the diaphragm should be incised and the base of the heart be massaged without further delay.

5. That no surgeon, even if relatively unskilled, should be content to abandon a case without giving his patient the benefit of direct cardiac massage.

6. We claim that this new technique offers a simpler method of approach and is a decided improvement upon

all other ways of doing direct heart massage, as it involves less risk of hæmorrhage, trauma, and shock, and can subsequently be more quickly and satisfactorily closed.

We are indebted to Lieutenant-Colonel Bond for permission to publish this case.

References.—1. T. A. Green: THE LANCET, 1906. ii., 1708–1714. See also Cackovic: Archiv klin. Chir., 1909; abstract in Jour. Amer. Med. Assoc., 1909, liii., 1549.
2. Frazier: Journal Amer. Med. Assoc., 1911, lvi., 1448. Lambert: Austral. Med. Journal, 1911-12, N.S. i., 527. Wrede: Arch. klin. Chir., 1913, ci., 833. Weitz: Deutsch. med. Woch., 1915, xli., 338. Breitman: Trans. Internat. Med. Congress, 1913, Sec. v., Pt. 2, 264. A. R. Thomas: Journal Roy. Nav. Med. Service, 1918, iv., 91.
3. W. M. Mollison: Brit. Journal Child. Dis., 1917, xiv., 42.

A MODIFICATION OF
WEBSTER'S TEST FOR THE PRESENCE OF T.N.T. IN URINE.

BY FRANK TUTIN.

(*From the Department of Biochemistry and Pharmacology, Medical Research Committee.*)

IT has been shown by Webster[1] that T.N.T., when taken by the mouth, or otherwise absorbed into the system, is excreted in an altered form in the urine, where its presence may readily be detected. The urine to be examined is first extracted with ether, then acidified with a mineral acid and again extracted with ether. In the latter extract the presence of the azoxy-compound formed by metabolisation from T.N.T. is readily shown by the development of a violet tint on the addition of alcoholic potash.

Possible Source of Error.

There is one possibility of confusion which, though it has probably been recognised by a number of workers, has apparently not hitherto been mentioned in published literature. Various purgatives (rhubarb, senna, cascara, &c.) contain substances (anthraquinone derivatives) which, when excreted in the urine, give under the conditions of Webster's test a red or reddish-violet colour, which might be mistaken for that produced by T.N.T. It is well known in medical practice that the urine of patients taking purgatives of this group will directly give a red colour with alkali, and this is rather loosely attributed to "chrysophanic acid." Chrysophanic acid is only one, and not the most important, of the substances concerned, and it seemed desirable to investigate the whole group from the point of view of their excretion and colour-producing properties, and to devise some modification of the T.N.T. test which would eliminate the possibility of confusion.

The results of this short investigation form the subject of this note. When I had completed it and had found that a slight modification of Webster's test made possible a clear distinction between the colour reaction due to T.N.T. and that due to any of the anthraquinone derivatives occurring in purgatives, I heard from Mr. Webster that he had himself come across the same possibility of error, that he had adopted the same modification of his test as that which I here suggest, and that he had found, like myself, that its introduction in any case sharpened and improved the T.N.T. reaction, whether anthraquinone derivatives were present or not.

My experiments were made firstly with the pure anthraquinone derivatives which occur in the different purgatives of this class, and secondly with doses of rhubarb root, since this drug contains all the known substituted anthraquinones present in the group.

The pure principles in question are rhein, aloe-emodin, emodin,[2] and chrysophanol ("chrysophanic acid"). They are all closely related chemically, the relation being briefly as follows: chrysophanol is a methyldihydroxyanthraquinone, aloe-emodin is the corresponding hydroxymethyldihydroxyanthraquinone, rhein the carboxylic acid yielded by the oxidation of aloe-emodin, and emodin is chrysophanol containing one additional, strongly phenolic hydroxyl group. These substances were each administered by the mouth in 0·1 g. doses, and in each case the urine subsequently collected, when examined by Webster's method, gave a strong colour reaction which might easily have been mistaken for that produced by T.N.T. On further investigating these four samples of urine it was found that the rhein had been rapidly excreted unchanged, whilst the other three anthraquinone derivatives had each undergone more or less oxidation, the aloe-emodin being entirely, and the chrysophanol partially, converted into the corresponding carboxylic acid (rhein), whilst a portion of the emodin appeared to be oxidised to the corresponding trihydroxyanthraquinone carboxylic acid, a substance which has not hitherto been known. In all cases, however, it was found that an ethereal liquid could be obtained which yielded no colour with alcoholic potash if the extracts obtained from the acidified urine were washed with dilute aqueous sodium carbonate before being treated with the stronger alkali. It was, moreover, found that the azoxy-compound formed from T.N.T., which is the substance which yields the characteristic "Webster reaction," is not removed from ether by treatment with dilute aqueous sodium carbonate.

Description of Modified Test.

These results, therefore, indicate a method by which anthraquinone derivatives may be eliminated from the ethereal extract to be tested by Webster's method, and it is recommended that the test should be conducted in the following modified manner:—

The urine should first be extracted with two successive portions of ether. This treatment removes any T.N.T. which may be present from accidental contamination, and also chrysophanol. The urine is then acidified with hydrochloric or sulphuric acid and again extracted with ether. During these extractions the addition of alcohol is usually necessary to cause the separation of emulsions. The ethereal extract of the acidified urine must then be extracted twice with dilute aqueous sodium carbonate, washed with water, and then treated with alcoholic potash, when the characteristic violet colour will be produced if derivatives of T.N.T. were present in the urine. If anthraquinone derivatives were present the sodium carbonate extracts will have a reddish-violet colour.

The method as originally described by Webster, and the modified procedure given above were then applied to samples of urine from three people who had previously taken respectively (*a*) 0·01 g. T.N.T., (*b*) 0·01 g. T.N.T. + 1 g. rhubarb root, and (*c*) 1 g. rhubarb root. When following Webster's procedure all three samples gave a positive reaction, but after treatment with sodium carbonate (*a*) and (*b*) gave reactions due to T.N.T. only, whilst (*c*) gave no reaction. Moreover, the colour yielded by (*a*) after treatment with sodium carbonate was a much purer violet and appeared more intense than before this treatment. This was due to the fact that sodium carbonate removes from the ethereal extract small amounts of substances which give a yellow or brownish colour with alkali, and therefore mask, to some extent, the characteristic colour of the "Webster reaction." The employment of the modified test here proposed would therefore appear to be desirable on all occasions when examining urine for T.N.T., even when the possibility of the presence of anthraquinone derivative is known to be precluded.

In conclusion, the author wishes to express his indebtedness to the Wellcome Chemical Research Laboratories, who supplied the specimens of pure anthraquinone derivatives which have been mentioned.

[1] THE LANCET, 1916, ii., p. 1029.

[2] Emodin monomethyl ether, another constituent of rhubarb, was not separately investigated, since this substance always behaves exactly similarly to chrysophanol, unless it suffers demethylation, when, of course, it yields emodin.

THE death is announced of Miss Agnes E. Weston, G.B.E., the "Sailor's Friend," at the Royal Sailor's Rest, Devonport, at the age of 78.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The University Entrance Scholarship in Anatomy and Physiology (value £50) has been awarded to Miss A. M. Freeman.

THE NATION'S TRIBUTE TO NURSES.—A meeting in support of the Hon. Sir Arthur Stanley's appeal to the nation for £100,000 as a tribute fund for nurses was held in Belfast on Oct. 17th. It was addressed, among others, by Mr. Henry McLoughlin, of Dublin, organising secretary of the movement in Ireland. The money raised in Ireland is to be invested in four Dublin trustees, and the interest is to be used on behalf of Irish nurses. It was decided to appeal for funds in Belfast, and office-bearers were appointed.

A NOTE ON

"ACUTE YELLOW ATROPHY" (?)

IN A MUNITION WORKER WITH A PSEUDO T.N.T. URINE REACTION DUE TO RHUBARB.

BY ERNEST GLYNN, F.R.C.P. LOND.,

CAPTAIN, R.A.M.C. (T.); PROFESSOR OF PATHOLOGY, UNIVERSITY OF LIVERPOOL.

(*Report to the Medical Research Committee.*)

THE patient was a female munition worker, aged 20, unmarried, and was employed in a T.N.T. factory from January, 1917, to June, 1918. Up to September, 1917, she worked in a "filling" room; here shells were filled with blocks of T.N.T., amatol coated with wax, and exploder bags containing T.N.T. Her duty was to handle the filled shells—she wore neither cap nor gloves. During this period her health was reported good—confirmed by her mother's statement. On Sept. 10th, 1917, for administrative reasons, she was transferred to a "cleaning" room, where she remained till death. She cleaned new or exploded brass cartridge cases for shells, which were covered with a small quantity of grease, by means of a weak watery solution of "nitre cake"; this is "the residue resulting from the manufacture of nitric acid and is an acid sulphate of soda containing 30 per cent. of its weight of sulphuric acid." She only handled the outside of the cases.[1]

Her health remained good until June 5th, when she vomited; on June 7th, as the vomiting persisted and slight jaundice appeared, she did not go to work; on June 12th she was unconscious, and next day was admitted to the Royal Infirmary under the care of Dr. J. C. Matthews, comatose, moderately jaundiced, temperature 101° F. Two ounces of urine removed with a catheter contained bile pigment and leucin, but no albumin; the biochemical laboratory reported that it gave the reaction of T.N.T. by Webster's test. The patient's temperature soon rose to 107°; there is no record of it before admission. She died 18 hours after admission—i.e., seven and a half days after stopping work and nine months after leaving the "filling" room.

Post-mortem.—The post-mortem was made 14 hours after death. Peritoneum: 4 oz., clear, slightly blood-stained, straw-coloured fluid. Very extensive petechial hæmorrhages becoming confluent over mesentery of small intestine and posterior surface of parietal peritoneum; a few hæmorrhages on visceral and parietal pericardium and posterior surface of visceral pleura. Liver: 41 oz., capsule not wrinkled, surface yellow ochre mottled with small capsular hæmorrhages; on section very soft and uniformly yellow; no fibrosis or compensatory hypertrophy. Gall-bladder: normal (the liver became much greener after preservation in formalin). Spleen: 6 oz., firm, normal. Stomach: post-mortem autolysis, a few hæmorrhages. Ileum: lower end intensely congested, a few hæmorrhages. Suprarenals: normal. Pancreas: normal. Kidneys: 5½ oz., rather pale. Ovaries: small hæmorrhages. Uterus: normal. Bone marrow of shaft of femur yellow and normal. Heart: soft and pale, 11 oz., no fatty degeneration. Lungs: posterior portion of both mottled, with numerous small hæmorrhages about half a centimetre in diameter, but tissue just floats; no pleurisy.

*Microscopical examination.**—Liver: There is very extensive focal necrosis affecting about a third of each liver lobule, central portion; many of the cells are reduced to fragments. Diffuse, uniform, fatty metamorphosis, about one-third of the whole liver staining red with Sudan III. In the non-necrotic areas the fat is deposited in the cell in fairly large droplets, but the nucleus is often lateral and stains normally; in the necrotic areas, however, where much fat is also present some of the surviving cells are uniformly loaded with it, apparently a deposit of small droplets, but the nucleus is central and shows marked chromatolysis. There is a slight but definite portal cirrhosis and a slight increase in "bile-ducts," with localised infiltrations of lymphocytes and a few plasma cells, but no leucocytes. A few collections of amorphous green bile-pigment present in the canaliculi and smaller bile-ducts; some of the liver cells contained brown granules; there is a moderate number of small dense clusters of fine brown acicular crystals, most probably hæmatoidin crystals; they are best seen in thick sections and on the borders of the necrotic areas. These crystals are not tyrosin because they do not resemble it in colour or shape, neither do they give the characteristic pink reaction with a mixture of mercuric acetate, sodium nitrite, and acetic acid. Professor Ramsden demonstrated that the tyrosin which has been acted on by formalin—the fixative used in this case—*does* give the characteristic tyrosin reaction.[2] Lungs—*Hæmorrhagic* areas: Alveoli and bronchioles filled chiefly with erythrocytes; also small localised collections of polymorphs; a few catarrhal cells and traces of fibrin; a considerable amount of hæmatoidin pigment in certain areas—some being in crystals similar to the crystals in the liver; smaller blood-vessels contain unorganising red thrombi. *Non-hæmorrhagic* areas: Often congested, sometimes alveoli contain erythrocytes or occasionally leucocytes and a little blood pigment. There are a few dense clusters of Gram-positive diplococci, most probably pneumococci, and occasionally Gram-negative bacilli, probably colon group; these bacteria are most numerous in the hæmorrhagic areas.

The macroscopic and microscopic appearances strongly suggest that the hæmorrhages are due to the leaking of the capillaries, their distribution being determined by gravity, and they occurred at different dates, while the pneumococci invaded the damaged tissues *after* the hæmorrhage. Similar hæmorrhages have been described in spirochætosis (Stokes and toxic jaundice (Stewart).

Comments.

The patient's occupation, her short acute illness, and the appearances of the liver exclude *death* from chronic T.N.T. poisoning. Nevertheless, it is highly probable that T.N.T. absorbed before September, 1917, caused the slight cirrhosis—there is no history of alcohol or syphilis. On the other hand, death might possibly be due to acute T.N.T. poisoning or to latent T.N.T. poisoning, perhaps assisted by an infection or other poison. Professor Stuart McDonald reports a small epidemic of five cases of acute yellow atrophy in syphilitics, treated with "606" *plus* mercury, and suggests that some bacterial infection might have precipitated the liver disease. Finally, death might be entirely due to poisoning with arsenic, phosphorus, &c., to spirochætosis ictero-hæmorrhagica, sometimes called Weil's disease, or, lastly, to "acute yellow atrophy."

Poisoning with arsenic, phosphorus, &c.—Though none of the workers in the "cleaning" room had ever suffered from toxic symptoms, it was thought advisable to eliminate the possibility of death from arseniuretted hydrogen. Phosphorus might conceivably have been taken with suicidal intent. The appearances of the liver were quite distinct from that of a case of phosphorus poisoning I once saw in a girl who took a large quantity of rat poison and died in three days. Here the liver weighed 64 oz., was uniformly affected; the nucleus was in the centre of the liver cells and showed marked chromatolysis. Mr. Roberts, Liverpool city analyst, reported that "the liver was free from phosphorus, arsenic, and poisonous metals."

Acute T.N.T. poisoning.—This seems to be out of the question.

Latent T.N.T. poisoning.—Dr. W. J. O'Donovan describes a fatal case where toxic symptoms suddenly developed two months after leaving a T.N.T. factory. J. A. P. Barnes alludes to a woman who had been filling bags with T.N.T. and "left for a country holiday in apparently excellent health." Three days later she developed toxic symptoms and only recovered in three months.

A third remarkable case, described as latent T.N.T. poisoning, is that of a woman who "after two months' work in processes in the manufacture of T.N.T. was transferred to another department where she was employed in filling drums with benzol and toluol. Over seven months later she met with an accident—a spanner falling on her head. Toxic jaundice developed one week later and proved fatal in a fortnight." *The liver weighed 23 oz. and showed some "gamboge patches." The patient had been away from the T.N.T. room through illness on three occasions from 1 to 3 weeks. Once the doctor certified she was suffering from "laryngitis from nitrous fumes"; he also said, "as she could not stand the work" she was "removed to the benzol department where she worked for 7 months." During this time she kept "her clothes in the same cloakroom as the T.N.T. workers" but "apart from them." *[3] If death was due to T.N.T. poisoning it is not conclusively proved that it was "*latent*." Dr. Legge informs me that benzene is

[1] Through the courtesy of Mr. Foggo I visited the factory in company with Dr. Mary Deacon, medical officer to an adjoining munition factory.

* Micro-photographs will appear in a later issue.

[2] The writer has examined, macroscopically and microscopically, the liver in two cases of acute yellow atrophy before the war—for one see Bradshaw, Brit. Med. Jour., 1901, vol. ii., p. 1587. One case of acute phosphorus poisoning and two of toxic jaundice due to T.N.T.

[3] The information between the two asterisks was obtained from the inquest report kindly provided by the factory inspector.

certainly toxic, both in acute and chronic form. In the acute, it produces rapid unconsciousness; in the chronic, aplastic anæmia precisely like that of T.N.T., with terminal symptoms of purpura hæmorrhagica. No cases, however, of "*jaundice or atrophy of the liver*" have been recorded either in Great Britain, the United States, Austria, or Sweden.

My case differs greatly from this, notably in the absence of symptoms when exposed to T.N.T., the longer "latent"? period—viz., 9 months—the short terminal illness, and the different liver changes. Latent poisoning is almost excluded.

Bacterial infection most probably did not precipitate the illness, for no bacteria were demonstrated in the liver and the spleen was small and firm. The pneumococci almost certainly invaded the lungs after the hæmorrhages had occurred, though they may have caused the terminal pyrexia.

Spirochætosis.—Immediately after the post-mortem many films from the liver and spleen—but, unfortunately, not the kidney—were examined by the dark ground for spirochætes, but the results were negative. A stale specimen of urine obtained post mortem was not injected into guinea-pigs owing to the difficulty of obtaining them.

In the fatal cases of this disease recently described in our Army, the liver has sometimes been slightly enlarged, though in the majority there was "an absence of any definite anatomical changes." In two cases, however, described by Sir Bertrand Dawson and W. E. Hume the liver cells were "dissociated" and "many markedly enlarged," but there was *no necrosis*, only a *little* fat, and the cellular infiltration of the portal areas contained *leucocytes* as well as lymphocytes. Thus, apart from the fact that the liver in our case was diminished in size, the pathological changes are markedly different. Careful inquiries, moreover, showed that the patient had seen no soldiers from abroad for a long period.

"*Acute yellow atrophy*."—The available evidence renders it probable that the patient died of "acute yellow atrophy"—whatever that is. The comparatively slight diminution in the size of the liver, the absence of red atrophy or of regeneration, and perhaps the excessive amount of fat, may be explained by the short duration of the illness.

Urine reaction.—If death was not due to T.N.T. poisoning the presence of the T.N.T. urine reaction requires explanation, especially as such reaction is apparently always absent in T.N.T. workers when toxic jaundice supervenes. The specimen was therefore sent to Professor Benjamin Moore, who reported that there was no T.N.T.; the misleading pink was due to some drug, e.g., phenolphthalein. On inquiry I found the patient had never taken phenolphthalein either before or after admission to hospital, but rhubarb and soda had been given before. My assistant, Dr. A. L. Robinson, indicated that rhubarb should give the test.

Dr. Matthews kindly administered a little rhubarb and soda for two or three days to four hospital patients. Their urine when tested by Webster's method gave a pink reaction, or pink-purple if strong—three of the urines were tested before administering rhubarb, with negative results; this colour appears to be due to chrysophanic acid or its derivatives.

The T.N.T. reaction is described as "purple" in the official communication,[4] and as "pink" in the Medical Research Committee Report, No. XI.—the Causation and Prevention of Tri-nitro-toluene (T.N.T.) Poisoning, p. 17.

Summary.

A young female munition worker, previous health always good, died suddenly of acute toxic jaundice (?) nine months after leaving the T.N.T. filling room. The liver, however, was much larger, more fatty, and more necrotic than in T.N.T. poisoning, and regeneration was absent. Poisoning with phosphorus or arsenic was excluded; latent T.N.T. poisoning with or without bacterial infection was almost excluded; spirochætosis ictero-hæmorrhagica is probably excluded. Death is therefore probably due to "acute yellow atrophy"—whatever that is. The pseudo T.N.T. reaction in the patient's urine was evidently due to rhubarb.

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[4] Brit. Med. Jour., Dec. 16th, 1916.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF INTRAPELVIC OSTEOMA NECESSITATING CÆSAREAN SECTION.

BY VIOLET I. RUSSELL, M.B., B.S. LOND.,
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AN osteoma arising from the pelvis is a sufficiently rare complication of labour to be worthy of record. The chief interest of the following case consists in its illustration of the importance of a routine examination of the pelvis during pregnancy in a primigravida; the tumour was causing no symptoms and might easily have remained undiagnosed until labour was advanced, when the prognosis for mother and child would have been much less favourable.

The patient, aged 19, was first seen when 28 weeks pregnant by Dr. Frances Huxley in the antenatal department of Queen Charlotte's Hospital. External pelvic measurements were approximately normal—interspinous 9 in., intercristal 10 in., and external conjugate 7¼ in. The fœtus was presenting by the vertex, the head being movable above the pelvic brim. On vaginal examination a bony tumour was felt occupying the left side of the pelvis; it was causing no symptoms. Mr. Clifford White examined the patient under anæsthesia when the osteoma was found to arise by a stout pedicle from the inner surface of ischium at the level of the acetabulum. It measured about 1½ × 2 in. in diameter, was uniformly hard, irregular in outline, and obviously proved an insuperable obstacle to delivery by the natural passages.

Cæsarean section was performed at term by Mr. Clifford White and a female child weighing 6 lb. 10 oz. was delivered. The internal relations of the growth were then defined. It was felt projecting between the layers of the broad ligament on the left side and was crossed by the left ureter; the origin of the tumour was in close relation with the bifurcation of the left common iliac artery, the external iliac vessels passing in front of growth and the internal iliac artery lying behind it.

Convalescence from operation was uneventful, and mother and child were discharged in good condition. The tumour has shown no increase in size since patient has been under observation and has never caused any symptoms.

I have to thank Mr. Clifford White for his kind permission to publish the case.

PNEUMOCOCCUS ARTHRITIS; VACCINE TREATMENT; RECOVERY.

BY C. E. CAMPBELL-HORSFALL, M.B., CH.B. VICT.

THE following case is of interest: first, because its commencement was very unusual—there had been no previous illness, nor was any focus of infection found; secondly, the method of treatment led to prompt recovery.

The patient, a middle-aged woman, was seized with pain in right knee; there was no history of injury or previous illness, and the condition was treated as a simple synovitis. The condition, however, did not subside, and a further diagnosis of rheumatoid arthritis was made and treatment carried out. No improvement took place, and gradually other joints were implicated. After several months' futile treatment she came under my care. At this time patient was utterly helpless and unable to move; even the upper extremities could only be moved with great pain. She was in a state of profound sepsis with typical septic temperature, skin a pale earthy colour, and marked anæmia of mucous membranes. Practically all joints were involved, the most marked changes being in knees, ankles, wrists, and shoulder-joints. The phalangeal joints were swollen, painful, and spindled-shaped. No reddening of any joints. Knee-joints distended with fluid; appetite poor.

I advised aspiration of knee-joint for diagnostic purposes. This was done and a bacteriological examination made of the fluid, this latter being a thick turbid material, greyish-yellow in appearance. On culture this showed a mixed infection of pneumococci and streptococci. A vaccine was made and treatment begun. She was kept in bed, given the maximum of fresh air, her bed being moved out on to a balcony when the weather was suitable. Her improvement as soon as vaccine was started was remarkable. Temperature steadily decreased, appetite returned, skin and blood condition improved, and pain abated. As soon as temperature became normal gentle message of limbs was commenced but joints were left severely alone at first. Later the latter were rubbed and moved. Progress was uninterrupted, and from an apparently dying woman she was restored to her former health, and at the present time it is impossible to realise that she had ever been so ill. She has free movement in all her limbs and can close her hands with ease.

The majority of pneumococcus arthritis cases are surgical and often one or two joints are affected. Surgical treatment in this case with a multiplicity of joints affected, even if successful, would have been very tedious, and much disuse of joints would have ensued. The termination of this case with its perfect recovery emphasises the necessity of having the joint fluid examined in every case of multiple arthritis when practicable. I can find no record of any case treated with a vaccine with such a pleasing result.

My thanks are due to Professor Walker Hall, of Bristol, who examined the fluid for me and prepared the vaccine.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

AT a general meeting of the Fellows of the Royal Society of Medicine on Tuesday, Oct. 15th, Sir RICKMAN GODLEE, the retiring President, introduced the new President, Surgeon Rear-Admiral Sir HUMPHRY ROLLESTON, and invested him with the President's badge (the gift of the late Sir Edward Sieveking, M.D., former President of the Society), and with the President's gold master-key (the gift of Mr. J. Y. W. MacAlister, the secretary). Sir Humphry Rolleston then took the chair and briefly thanked the Fellows for the honour of his election, and asked for the sympathy and support of all of them in the discharge of his duties during what might prove to be a very trying period. The ordinary business of the meeting was then proceeded with and a number of new Fellows upon ballot were elected.

On this occasion there was a pleasing innovation before the meeting, which, it is hoped, will become the custom. Tea was served in the President's private room, and Sir Humphry Rolleston received the Fellows who had come to attend the meeting; in this way becoming personally acquainted with those whom he had not previously met, and renewing many old acquaintances.

COMBINED SECTIONS OF MEDICINE, PATHOLOGY, AND EPIDEMIOLOGY.

Encephalitis Lethargica.

THE occurrence in the earlier part of this year of numerous cases characterised by lethargy, asthenia, and paralysis, usually of the cranial nerves, aroused widespread interest at the time, and has led to a large amount of research. At a joint meeting of the Medical, Pathological, and Epidemiological Sections of the Royal Society of Medicine held on Oct. 22nd the results of these investigations were discussed at length. A brief summary of this discussion follows, the detailed report being reserved for a later issue.

The *stages in the development of our knowledge* of the disease may be stated thus: After a short period, during which the striking lethargy led to the somewhat sensational diagnosis of "botulism" the failure to find the *Bacillus botulinus*, together with the discovery of areas of perivascular infiltration in the central nervous system, caused many to assume that the disease was acute poliomyelitis of the cerebral type occurring in epidemic form. This assumption was all the more natural because the observers of epidemics of the latter disease had laid special stress on the protean character of the symptomatology, Wickman describing no less than seven types. At an early stage, however, clinical observers began to note that the disease possessed a characteristic symptomatology which differed from that of acute poliomyelitis. The extensive investigations which have since been carried out appear from the discussion to have led to the almost unanimous adoption of the view that the disease is not acute poliomyelitis but is sui generis, with a symptomatology of its own, varying according to the precise areas of the central nervous system affected in individual cases, with a characteristic pathological picture and definite epidemiological peculiarities.

The *onset* is frequently sudden, but more often there is a prodromal stage lasting a few days, with lassitude, headache, and sometimes vomiting of the cerebral type. The patient then passes into a lethargic condition, from which, however, he can be roused and in which he remains conscious of what is passing around him. Nocturnal wakefulness with or without delirium is not uncommon. There is general asthenia, with definite local paralysis, particularly of the ocular muscles, the muscles of the face, and, less frequently, of the pharynx, giving rise to strabismus, nystagmoid movement of the eyes, dysarthria of speech, dysphagia, and a mask-like expression. The onset of the local palsies is described as "wandering," first this, then that, group of muscles being affected. The headache, vomiting, delirium, dysarthria of speech, occasional katatonia, and incontinence have caused individual cases to be initially diagnosed as "functional," G.P.I., or tuberculous meningitis. The course of the disease is variable; in some instances death takes place within a few days of onset through paralysis of respiration, but in most recovery has ensued after an illness lasting several months.

The typical *pathological lesions* are hæmorrhagic foci with lymphocytic infiltration of the small vessels. They are found mainly in the midbrain and pons, but may occur anywhere in the cerebrum, cerebellum, or spinal cord. Colonel F. W. Mott (who also communicated the results of investigations carried out by Professor Marinesco) describes these lesions as differing markedly from those found in acute poliomyelitis, particularly in the rarity of neuronophagia and in the hæmorrhagic nature of the lesions. He found no organisms. The cerebro-spinal fluid shows lymphocytosis in some cases, in others none; the discrepancy may be explained by the fluids having been examined at different stages in the disease. Blood is found frequently; its presence may be considered characteristic of acute cases of the meningeal type.

The *epidemiology* of the disease presents features which distinguish it clearly from acute poliomyelitis. As a result of the findings of the Local Government Board inquiry held by Sir Arthur Newsholme, Lieutenant-Colonel S. P. James reported that the disease occurs at all ages and shows no preference for the young; its seasonal incidence shows a maximum in the spring, whereas acute poliomyelitis is at its height in August and September; the distribution of cases in England and Wales shows no correlation between the two diseases. The report of the Local Government Board will be issued shortly. It is to be hoped that the compulsory notification of Encephalitis lethargica will be as successful in adding to our knowledge as it has been in other instances. So far research has chiefly resulted in clearing the ground, and practically everything constructive remains to be done, particularly in regard to treatment.

SOCIÉTÉ DE BIOLOGIE, PARIS.

THE following is a summary of the papers read at a meeting of this society held on Oct. 12th:—

DUJARRIC DE LA RIVIERE: Bacteriological Diagnosis of Influenza.

Prélever 10 c.m.c. d'urine aseptiquement, ensemencer en milieu eau peptonée (sang de poule). Alors que les autres procédés échouent, la présente technique décèle le B. de Pfeiffer dans presque tous les cas.

R. J. WEISSENBACH: A New Medium for Differentiating the Enterococcus from Certain Streptococci.

Les streptocoques non hémolytiques se comportent comme les streptocoques hémolytiques quand ils sont ensemencés en eau peptonée glucosée, additionnée de bile. Alors que l'entérocoque, après 18 à 24 heures d'étuve à 37° cultive abondamment dans ce milieu, les streptocoques pyogènes hémolytiques et non hémolytiques ne donnent naissance à aucune culture en 18, 24 heures et au-delà. A défaut du pouvoir hémolytique, qui constitue dans la pratique un des meilleurs caractères différentiels entre l'entérocoque et la variété hémolytique du streptocoque, la plus fréquemment en cause en pathologie humaine, le résultat de l'ensemencement en eau peptonée glucosée à la bile constitue pour le streptocoque hémolytique, un excellent élément de différenciation.

GERARD: Thermal Instability of Syphilitic Antibodies.

En évaluant les limites maxima de déviation du complément produites par un même sérum chauffé à 56° et non chauffé, on s'aperçoit de la constance thermolabilité des anticorps syphilitiques. Le pouvoir de déviation peut être abaissé des trois quarts. Conclusion: Associez toujours dans les Wassermann les deux méthodes au sérum chauffé et non chauffé. Rétuisez, dans la méthode complète, le temps de chauffage à 56° pour destruction du complément à un quart d'heure au lieu du temps classique de une demie-heure.

LATAPIE: Experimental Influenza.

Les bacilles de l'influenza restent vivants pendant 4 mois dans les abcès provoqués expérimentalement chez les cobayes et 22 mois en sac de collodion chez les mêmes animaux. Chez une chèvre soumise à l'immunisation pendant onze mois, le sérum se montre même curatif: des cobayes inoculés avec une dose plusieurs fois mortelle de microbes dans le péritoine et devant mourir en moins de 24 heures pouvaient être préservés par du sérum injecté dans les veines trois heures avant la mort. L'auteur met en garde contre la toxicité du sérum récolté peu de temps après l'injection des microbes; passé le délai de trois semaines depuis la dernière injection, cette toxicité n'existe plus.

M. NICOLLE: Restitution of Agglutinability.

Quand les pneumocoques et les gonocoques ont perdu leur agglutinabilité, on peut la leur restituer en les traitant par l'acide chlorhydrique en les chauffant, enfin en les neutralisant par la soude.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, LONDON.—Founder's Day will be celebrated on Monday, Nov. 4th, when the wards will be open to inspection from 3 to 6 P.M.

Reviews and Notices of Books.

The Evolution of National Systems of Vocational Re-education for Disabled Soldiers and Sailors. By DOUGLAS C. MCMURTRIE. Washington, U.S.A.: Federal Board for Vocation Education. 1918. Bulletin No. 15 (Re-education Series No. 3). Pp. 265.

As the title denotes, this report traces the evolution of the systems of vocational re-education for disabled soldiers and sailors in the countries where such systems exist. The material for the sections relating to France and Belgium has been prepared by Miss G. G. Whiteside, to Great Britain by Dr. J. C. Faries, to Italy and Germany by Miss R. Underhill, and to Austria by Mr. A. Gourvitch. In the introduction Mr. McMurtrie emphasises the part played in the evolution of these systems by the Belgian trade schools for crippled victims of industrial accidents. The obvious corollary, the extension of the facilities for disabled soldiers to industrial cripples, has recently been suggested in the British lay press. As Mr. McMurtrie points out, the dictates of national gratitude and national economy coincide as to the need for systems of re-education. As the result of a review of the various systems he has drawn various conclusions. He holds it to be axiomatic that a man should be given his course of training in a locality near his home. He is not in favour of compulsory re-education; the unwilling pupil learns but little. "If a competent visitor has been in touch with the man's family during his absence at the front the members of the home circle can be easily convinced of the wisdom of his re-education; this will make all the simpler persuasion of the man himself." The choice of a particular trade must meet with the full approval of the soldier himself; Mr. McMurtrie would allow the man, within reasonable limitations, to change to another trade if the subject prove definitely distasteful. To persuade him to undertake training the disabled man should be informed of the progress of men with similar physical handicaps, but this information must be accurate and not relate to freak successes. "It would seem inadvisable to train a man for an occupation which he can pursue only by means of specialised apparatus adapted to individual motor limitations imposed by his deformity. While a badly crippled man may be taught to operate a lathe with special treadles his opportunities for employment will be precarious." Many of those interested in the problem will not agree with Mr. McMurtrie in this conclusion, especially if State workshops be provided for men with severely crippled arms. The American Red Cross Society, however, appear to be more optimistic than we are as to the possibility of industrial firms providing work for this class of man. An interesting commentary is that the training provided must be thorough; there would be an unjustified disturbance of the labour market and its wage-standards if a school thrusts into a trade, as professedly skilled operatives, a crowd of under-trained men. As regards employment disabled soldiers must be considered as a special class. The transition from military to civilian life which takes place on a man taking up his first job is a more radical step than the change made when the civilian employee goes from one position to another. For this reason Mr. McMurtrie advocates the appointment of specially trained employment officers for placing and following up disabled men.

The section on the work in Great Britain contains some racy comments on our ways of doing things, but pays a tribute to the system which has ultimately been evolved. Although the writers of the report do not make the comment, we have something to learn from Germany in our treatment of one-armed men. In no less than 14 trade schools, scattered over the various German states, special courses are held for one-armed men. After preliminary instruction of about six weeks in the ordinary acts of every-day life, and a course of left-handed writing, if necessary, the men take up trade training. Again, in the larger matter of simultaneous medical treatment and re-education we are behind other countries. In Germany re-education is undertaken by civilian care committees working in military hospitals. The section on France tells us that the schools which admit soldiers only when completely cured have considerable difficulty in obtaining pupils, while the schools at Montpellier and Bordeaux have found their usefulness increased since they have been linked up with hospitals. Coöperation between hospital and school has from the beginning been carried out successfully at Saint Maurice, the Grand Palais, and Maison Blanche. Dr. Kresser, head of the school at Maison Blanche, writes: "The best recruiting agency for the schools is the example of the man who works at a trade during the day and who, on his return to his pavilion in the evening, tells his companions what he has been doing and what he has earned." The excellent results obtained at the South African Military Hospital, Richmond Park, show the value of coincident medical treatment and vocational re-education. The percentage of disabled men who undertake training is extremely high—over 90. If the commanding officer of the hospital considers a man will not become fit for further military service no time is lost in commencing his re-education. The training does not stop when the man is discharged from hospital; he is accommodated at a hostel and continues his course; during this time the men continue to wear their uniform and remain under military discipline.

An appendix contains a comprehensive bibliography of the subject. As a review of the systems of re-education the report is unique; it cannot fail to be of the greatest value to the workers in the United States of America for whom it was written.

Clinical Diagnosis: A Manual of Laboratory Methods. By JAMES CAMPBELL TODD, Ph.B., M.D., Professor of Clinical Pathology, University of Colorado. Illustrated. Fourth edition, revised and reset. London and Philadelphia: W. B. Saunders Co. 1918. Pp. 637. 14*s.*

THIS work is a practical manual which treats of the more important methods employed in the investigation of those problems of diagnosis which are now customarily submitted to the clinical laboratory. In reviewing earlier editions of the book[1] a favourable opinion was expressed as to its merits, and practical use of this work in the reviewer's laboratory has confirmed this opinion. The methods selected are usually good and the directions clear and precise, while the deductions drawn from the results of the investigations are judicious.

A considerable number of additions and alterations have been made in the present edition which have improved it and brought it up to date without undue increase in size or price. On the other hand, some methods have been omitted and these include Abderhalden's protective ferment reaction to which exception was taken in the review of the 1914 edition. Important additions are to be found in the section on blood examination. These include the methods for recognising blood by spectroscopic and chemical means, for the vital staining of blood cells and for testing the resistance of red cells. The methods used in the selection of blood for the purposes of transfusion and for matching bloods are now given, together with a short account of the theoretical basis for these methods. The plan devised by Bass and Johns for facilitating the search for malarial parasites in the blood by concentration is described and recommended. An illustration shows the satisfactory results obtained. In the examination of cerebro-spinal fluid two new tests are proposed—Lange's colloidal gold test and the "mastic test"—for the purpose of distinguishing pathological changes in the central nervous system, especially those caused by syphilis. Changes and simplifications in the technique for carrying out the phenol-sulphone-phthalein test of the functional activity of the kidneys are described, and further details are given as to the clinical interpretation and value of the test. There are many other additions, including Schick's test for immunity to diphtheria, Craig's method for the complement deviation test for tubercle, the estimation of urobilin in fæces, which is useful in the diagnosis of pernicious anæmia, and of amylase in fæces, useful in suspected pancreatic disease.

The illustrations have always been an important feature of this book, and in the present edition there has been a marked improvement effected by substitution for the less satisfactory plates and figures of better ones and considerable additions of new figures, among which may be mentioned a representation of Curschmann's spirals, as seen in the usual naked-eye examination of asthmatic sputum, and one of *Entamæba gingivalis*. The production of the book leaves little to be desired.

[1] THE LANCET, April 10th, 1915.

THE LANCET.

LONDON: SATURDAY, OCTOBER 26, 1918.

Our Present Knowledge of Epidemic Catarrh.

EPIDEMIC catarrh has once again become pandemic in character. Reports are being daily received of its prevalence all over the world, some of them of a highly alarmist nature. The issue of an authoritative Memorandum on epidemic catarrh, including influenza, by the medical officer of the Local Government Board is therefore peculiarly opportune, especially as the document has been sent to all the local authorities in the country, with a suggestion to the health officer to prepare precautionary instructions for use in his district. After discussing certain statistical facts in relation to the deaths from respiratory diseases in general, and alluding to the micro-organisms generally associated with a "common cold," Sir ARTHUR NEWSHOLME reminds us that influenza has been identified historically for several centuries past, appearing and causing great havoc in many countries at intervals which have been so prolonged as to create the impression on its reappearance that a new disease had emerged. Dr. F. G. CROOKSHANK has, in fact, given the title of "The Story of a New Disease" to the Chadwick Lectures which he is delivering, and Sir RICHARD DOUGLAS POWELL, presiding at one of these lectures, emphasised the remarkable coincidence between epidemics of influenza and outbreaks of poliomyelitis, a coincidence which should lead to a more careful scrutiny of influenza as a syndrome of many diseases yet to be accurately defined and demarcated. Dr. W. COLLIER, of Oxford, calls attention in our correspondence columns to certain unfamiliar features in the cases under his observation. A study of Dr. FRANKLIN PARSONS'S classical reports to the Local Government Board on the pandemic of 1889–92 shows the impression then prevailing of a novel disease, although 43 years earlier (1847–48) and in 1803, 1833, and 1837–38 epidemics of influenza occurred in this country. Dr. W. H. HAMER has adduced evidence of the same experience in even earlier literature.

The difficulty of defining influenza is, of course, great, its most characteristic feature being its occurrence at long intervals as an epidemic which spreads rapidly from country to country and from continent to continent, and which affects a much higher proportion of the total population than any other known infectious disease. The Memorandum of the Local Government Board takes the view that the question whether Pfeiffer's bacillus is the specific cause of influenza is still an open one. Unfortunately, no specific agglutination tests are yet available in connexion with this micro-organism. That it causes much of the mischief produced by the disease is proved by its frequent presence in large numbers in immediate relation to minute lesions occurring in the lung. It should be noted, however, that the Pfeiffer bacillus is occasionally discovered in bronchial secretions when there is no suspicion of influenza; but, on the other hand, the bacillus has not been found, or has only been discovered in a very small minority of the total cases, in a considerable number of outbreaks indistinguishable clinically from influenza. The Memorandum itself does not state whether this is the case in the present epidemic, but information from several sources suggests that Pfeiffer's bacillus has not often been identified. Failure to isolate the bacillus may be due in certain instances to want of a suitable culture medium, as was pointed out recently in our columns by Dr. JOHN MATTHEWS. In outbreaks in which this bacillus is absent the *M. catarrhalis*, the pneumococcus, or a hæmolytic streptococcus has generally been the predominant micro-organisms. It is difficult, therefore, to establish an accurate bacteriological test for influenza, and on account of its multiform clinical symptoms a definite diagnosis is not always easy. This fact stands greatly in the way of any specific treatment of the pandemic malady, although much attention has been given to this aspect of the problem. On another page of this issue of THE LANCET an account is given of a Conference held at the War Office to discuss the utilisation of vaccine for the prevention and treatment of influenza, and a précis of the conclusions arrived at by the bacteriological experts who attended this Conference is embodied in an appendix to the Local Government Board's Memorandum. At this Conference it was unanimously agreed that inoculations with a suitable vaccine might be expected to be of value, although there is at present no vaccine on which dependence can be placed to give immunity against influenza.

General precautions, fortunately, are on a sounder footing, and the Memorandum of the Local Government Board rightly points out that control over the disease is only practicable by the active coöperation of each member of the community. The measures suggested are largely such as a sensitive hygienic conscience would direct. Most persons attacked by influenza do not recognise for several days the serious nature of their illness, and it is probable that infection is chiefly spread during the earlier stages. This, and the fact that one attack does not appear to confer any great degree of immunity against further attacks, render the application of preventive measures far from easy. In view of the difficulty in securing early and decisive diagnosis, especially in connexion with the milder cases for which medical guidance is not obtained, notification cannot be recommended as likely to be of practical use. The isolation of all persons suffering from fever, with or without catarrh, is recommended in the Memorandum; but, however desirable such a course might be, it would be difficult to accomplish on a large scale. As infection is probably conveyed in part by the fine spray of mucus ejected in the act of coughing or sneezing, it is advised that a handkerchief should be held before the mouth at such times in order to intercept the droplets of mucus, and that the handkerchief should afterwards be boiled. Disinfection of premises after

influenza is not recommended, but a thorough washing and cleansing of rooms and their contents and washing of articles of bedding or apparel are desirable. The familiar advice is given that the patient should go to bed on the first onset of the symptoms and remain there till all fever has gone. The only safe rule is to regard all catarrhal attacks and every illness associated with rise of temperature as infectious, and to adopt at once precautionary measures. The wet cleansing of all infected places is important. Indiscriminate spitting is dangerous, and prolonged mental strain or over-fatigue, and still more alcoholism, are all conditions which predispose to attack. As a prophylactic measure gargling the throat with a solution of 1 in 5000 permanganate of potassium in water containing 0·8 per cent. of common salt night and morning is useful. It is pointed out that sanitary authorities have power, with the Local Government Board's sanction, to provide nursing assistance for those who are unable to obtain it for themselves. The possible public provision of a prophylactic spraying apparatus, such as is used in the Army, is considered. The view is expressed, however, that the "spray room" cannot yet be regarded as reducing for certain the incidence of attacks in exposed persons, and unless precautions are taken to separate patients from healthy persons it may even be the means of disseminating infection. The final, and probably the most important advice of all is that bedrooms and living rooms should be constantly flushed with fresh air, and that overcrowded rooms and places of amusement should be avoided. The aggregation of large numbers of persons in one room, especially for sleeping, is dangerous when catarrhs are prevalent, even though the floor space for each person may appear to be adequate.

Sir ARTHUR NEWSHOLME'S Memorandum presents us with an admirable summary of the outstanding features of influenza epidemics, so far as they have been ascertained, and of the prophylactic measures to be employed in connexion with that disease. It helps us also to realise how little is yet known about the epidemic catarrhal conditions which are the cause of so much illness and death, and emphasises the urgent need for further investigation.

Juries on Trial.

By the Juries Act, 1918, which came into force on July 30th the right to a jury is limited in civil cases during the war and for six months afterwards. Under this Act every "action, counterclaim, issue, cause or matter in the High Court of England requiring to be tried" is to be tried by a judge sitting alone. This does not affect any power to order a trial by two or more judges, or a judge with an assessor, or any such special tribunal as heretofore. It is also subject to the proviso that in cases in which fraud is alleged, or where the claim is in respect of libel, slander, malicious prosecution, false imprisonment, seduction, or breach of promise of marriage, either party is entitled to have a jury upon applying for one in the prescribed manner. Also in other cases than the above a judge may order the trial to be with a jury on the application of a party, if the case appears to him to be more fit for trial with than without one, and a jury is to be granted, if applied for, in certain contested matrimonial causes and in certain causes in the Probate Court. Trial without a jury is ordered upon practically similar terms in county courts and other courts of inferior jurisdiction. This may seem a more sweeping change than it really is. The general public, familiar with the phrase that the jury is the palladium of liberty, and interested mainly, as far as civil cases are concerned, in those of the more sensational kind, does not realise how much the jury has been dispensed with. In the Courts of Chancery and Admiralty there is never a jury, and in a great number of important commercial causes, as well as in the majority of divorce cases and of trials in the county court, there is none either; and though criminal cases are not affected by the new Act, very many more criminal charges are disposed of without a jury than with one. The tendency to diminish the number of trials by jury is not a new one. In the Common Law courts, since the Judicature Acts were passed towards the end of the last century, many cases, besides the commercial causes already referred to, are now heard by judges alone for which juries would formerly have been necessary, and no one has complained. It would seem, therefore, as if the jury, once a bulwark of the people against the aggression of the Crown or the executive or any other oppressor, was coming to be regarded as a cumbrous survival.

Few will deny that without a jury many trials would be shorter; while men unwilling to serve, unwilling to give full attention to, or, perhaps, unable to understand the evidence may be present on a jury and prevent justice being done. Judges are human it is true, and liable to human sympathies and prejudices, but so in a greater degree are juries; and although sympathy may be an excellent thing in individuals it can lead to absolute injustice in 12 men assembled to try, not whether a plaintiff has suffered and the defendant *can afford to pay* compensation for that suffering, but whether the defendant is legally responsible for that suffering, so that in justice he *ought to pay* for it. Juries also fail sometimes to arrive at unanimous verdicts, or members of them have to be cajoled by their fellows into agreement which is contrary to their honest judgment. Either happening is undesirable, and the former leads to delay and increased expense for the parties to the trial. It may be observed also that it is after long trials contested at great expense that disagreement on the part of the jury most frequently occurs. The action against the British Medical Association recently tried by Mr. Justice MCCARDIE may be referred to as a case in point. This was one of those long-drawn-out and hard-fought trials, in which sympathisers with the British Medical Association in its effort to maintain its ethical standards might have found themselves on a jury pitted against others with preconceived views antagonistic

to doctors, and hence determined from the first to regard the plaintiffs as men unjustly oppressed, for whom no damages could be too ample. A disagreement in such circumstances would have been in no way surprising had the decision been left to a jury, and this would have been very expensive to both parties; a verdict for the plaintiffs, such as Mr. Justice MCCARDIE found, but with damages of unjust and disproportionate magnitude, would have been a second likely issue. We do not know whether an appeal may follow in this case or whether the fact of no appeal being entered will indicate the acquiescence of the losers with the learned judge's statement of the law and his application of it to the facts before him; but in ordinary circumstances in libel cases we believe that a jury is unnecessary for the assessment of damages and that a fairer and more satisfactory result may be arrived at without one.

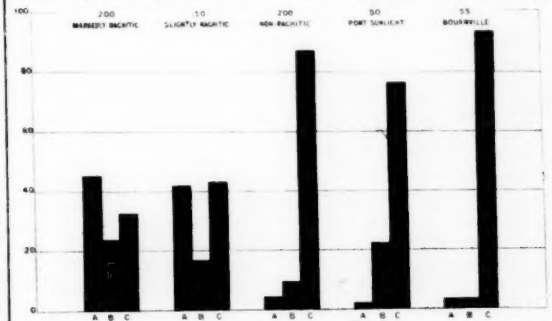
Dr. F. J. WALDO, the coroner for the City of London and the Borough of Southwark, appears to have been questioned recently by a juryman as to why he was continuing to summon juries to sit at inquests when other coroners were availing themselves of the Act above referred to and dispensing with their services. In making a reply to this question at the close of an inquest Dr. WALDO explained that a discretion was allowed to him, in the exercise of which he was guided by what he believed to be principles of public policy and usefulness. At inquests in the course of which it appeared that murder or manslaughter was to be suspected, he was still obliged to summon a jury, and according to his experience in the majority of the inquests that he held questions of culpable negligence were likely to arise. This was due to the fact that a large number of the deaths which he inquired into were caused by accidents in factories or elsewhere, when the presence or absence of negligence was the essential fact to be ascertained. In such cases he believed that the public interest was best served and the public confidence retained by the course which he followed. Here we agree with him, while we congratulate him on being able to refer in such complimentary terms to the quality of the juries in the areas for which he is coroner—men, he described them, who are well able to follow and weigh the evidence laid before them. Not all juries are as intelligent or as competent to discharge their functions as those of the City and of Southwark, but such busy areas as these are even less able than others to supply persons who can be spared from their usual avocations. It seems likely to us that coroners will have to be prepared for a continuance of conditions imposed in view of the new and unprecedented state of affairs which has recently prevailed, and we have no doubt that they will be fully equal to the occasion. They can obtain for their guidance in all difficult cases the evidence of expert pathologists as well as that of medical practitioners equipped by modern training, and they are themselves either men with medical qualifications, or who, in the practice of their previous professions, as barristers or solicitors, have learnt to grasp and to appreciate the essential points in scientific and other evidence laid before them. The medical witness has not always been handled with courtesy or intelligence by coroners, but it is the uneducated juryman whom he really fears and whose disappearance he will not regret.

Annotations.

"Ne quid nimis."

RICKETS AND FRESH AIR.

THE most striking chart in the Medical Research Committee's study of the causation of rickets[1] is that dealing with the effect of air and exercise. For the purpose of this inquiry Miss Margaret Ferguson divided the children whose social and economic state she was investigating into (A) those who were not taken out at all; (B) those who were taken out a little; and (C) those who were taken out sufficiently. In the series of 200 markedly rachitic Glasgow children, over 40 per cent. had not been taken out into the fresh air at all, while in a similar series of 200 non-rachitic children only 4 per cent. had been confined indoors. These observations are made graphic on the chart which we reproduce here, along with a comparison with groups of children at Port Sunlight and Bournville. The conclusion drawn from these observations by Professor Noël Paton and Dr. Leonard Findlay, reviewing the evidence (the report states) "as a small



jury," is that inadequate air and exercise seem to be potent factors in determining the onset of rickets. The report frankly admits the possible fallacies in any purely observational method of inquiry, and suggests that the significance of "lack of air and exercise" in causing rickets can only be determined in terms of specific physiological processes by methods of experiment. The weight of evidence in Miss Ferguson's social inquiries is against a close association between deficient diet and the rickety condition, whereas in Dr. Edward Mellanby's study of experimental rickets in dogs (summarised in the Research Committee's last annual report) accessory factors in food appeared to play a large part. These are matters of first importance to large masses of our industrial population, especially under war-time conditions, and the Medical Research Committee cannot do better with the funds of the National Health Insurance than devote them to the elucidation of such problems.

CEREBELLAR SYNDROME FOLLOWING HEAT-STROKE.

WITH our various extensive campaigns in tropical and subtropical zones heat apoplexy or heat-stroke (thermic fever, siriasis) has come into prominence as a cause of incapacity, and the toll it has already taken of some that the profession could ill spare is added reason for its careful investigation. In the current number of the *Review of Neurology and*

[1] A Study of Social and Economic Factors in the Causation of Rickets. With an introductory historical survey. Special Report Series, No. 20. 1918. Price 2s.

Psychiatry is a paper by Dr. R. M. Stewart, describing in detail the clinical phenomena in a case the sequelæ of which were peculiar and perhaps unique.

The patient, a soldier, aged 32, was in Egypt in October, 1914, and after a 26 hours' journey by train with his regiment marched to barracks, a distance of about a mile. The men wore sun-helmets, thick serge uniforms, and carried their full equipment on their backs. The temperature was 109° F. in the shade. Shortly after his company had been dismissed he was found lying outside a barrack-room, deeply unconscious. He was at once admitted to hospital, where he was seen to be comatose, flushed, with stertorous breathing and with occasional irregular clonic epileptiform movements. His body temperature was 109·2°. For a week it remained high, varying between 100° and 103°. During this time he was profoundly unconscious and nasal feeding was resorted to. Some ten days from the onset he began to show signs of recovery, but his sentences were mere gibberish; he was childish, and incontinent of urine and fæces. By Dec. 10th he had improved considerably and sphincter control was normal. He was then noted as having developed a spastic paresis of the legs, with marked ataxia of all four limbs. A careful examination on his admission to a military hospital in England in April, 1915, showed that the condition was one of spastic paraplegia, with double extensor response, lateral nystagmus, extreme dysarthria, involuntary movements of the limbs more or less athetoid in type, ataxia in voluntary movements; in addition he was childish and distinctly emotional, laughing in a silly manner.

Dr. Stewart supplies a minute description of his cerebellar symptoms, which were characterised by a definite degree of dysmetria and asynergy on both sides while adiadococinesia was readily demonstrable. In the absence of any pathological examination it is perhaps undesirable to dogmatise as to the nature and site or sites of the lesion. Dr. Stewart is of the opinion that the patient's improvement under simple hydrotherapeutic treatment in no way favours the belief that some disease other than heat apoplexy was present. If only for the sake of exclusion, however, it is regrettable that apparently no chance of a blood or fluid examination for syphilis occurred, especially since in some cases of what has appeared to be heat-stroke a syphilitic basis has been present. Experimental investigation has shown that the effect of extremes of heat on the organism is to produce a state of coagulation-necrosis of nerve cells. Pathological changes consisting in meningeal congestion, minute hæmorrhages in the white matter, coagulation-necrosis of nerve cells, with chromatolysis of the Nissl substance and swelling and disintegration of cell nuclei, have been described in recent cases of heat apoplexy. The possible localisation of the symptoms in Dr. Stewart's interesting case is a matter of some difficulty. He concludes that some of the symptoms were clearly due to implication of the cerebrum, notably the epileptiform attacks, the spastic paralysis, the speech disturbances, the emotional condition, and "weakmindedness." The residual symptoms, which chiefly characterised the patient's clinical state when he came under observation, are attributable, according to Dr. Stewart, to organic disease of the cerebellum. It might be suggested that much of the clinical syndrome appears due to involvement of areas in the supply of the basilar artery and its branches. A case reported (in a shorthand journal) by the late Sir William Gowers, of occlusion of the basilar from an endocarditic embolus bears a close resemblance, as far as the involvement of ponto-cerebellar and ponto-medullary mechanisms are concerned, to Dr. Stewart's case. In it, further, there was an initial body temperature of no less than 110° F., carefully verified by more than one thermometer, though, of course, heat apoplexy was out of the question. Evidently, however, in the case of the soldier the condition was widespread in its beginning. Of its organic nature there is no question. The occurrence of such organic nervous changes in association with heat-stroke is worthy of note. Dr. Stewart has reported a case of considerable clinical importance and of much interest.

ETHER DAY IN LONDON, OCTOBER 16.

IT was a happy thought on the part of the old house physicians and surgeons of the Massachusetts General Hospital, attached to various American base hospitals in England, to celebrate the introduction of surgical anæsthesia. Ten years ago the trustees of the Massachusetts General Hospital decided to set apart Oct. 16th as "Ether Day" in commemoration of the first public demonstration and the practical introduction of anæsthesia in surgery. The occasion is worthy to be held in everlasting remembrance. John Collins Warren (the second of the name of the distinguished family, five generations of which have adorned the profession of Boston) performed the operation and realised the extraordinary importance of a discovery that would awaken, as he predicted, the gratitude of the present and of all coming generations. To keep alive the memory of the occasion is the object of Ether Day, and already important addresses have been given by Professor Welch, President Eliot, and others in commemoration of the event. About 20 Massachusetts Hospital men assembled at dinner recently under the chairmanship of Colonel Washburn, the superintendent of the hospital, and now in charge of American hospitals in England. General Winters and Sir William Osler were the only guests. The latter told the story of the introduction of surgical anæsthesia, and showed what an old practice it was and how, time out of mind, patients had been rendered insensible by potions or vapours, without any one man forcing any one method into general acceptance, or influencing in any way surgical practice. Before Oct. 16th, 1846, surgical anæsthesia did not exist; within a few months it had become a world-wide procedure. The original papers of Bigelow and Warren, and those of William T. G. Morton (to whom the full credit for the introduction was given) were exhibited.

PHLEBITIS DUE TO EFFORT

APART from traumatic subcutaneous rupture of veins thrombo-phlebitis is generally regarded as due to infection. However, cases have been recorded in the upper limbs, principally on the right side, which were apparently spontaneous in origin, there being no source of infection. Such cases have been described, sometimes improperly, as phlebitis due to effort. In the *Progrès Médical* M. Jean Murard has reported the following case:—

An artilleryman, aged 24 years, was admitted to hospital for a swelling of the right upper limb. A fortnight previously he had to do some urgent work on his battery which necessitated great efforts of the right arm for two days and nights, with only short intervals of rest. After this he had a sensation of great fatigue in the whole upper limb and noticed small varices in the upper third of the arm. On the following days the sensation increased and the limb felt heavy. Two days before admission he noticed œdema of the arm, which extended to the forearm and then to the hand. A medical man ordered hot fomentations and painting with tincture of iodine. As there was no improvement he diagnosed phlegmon and sent the patient to hospital for incision. On examination the limb was œdematous from the deltoid region to the fingers. The œdema was greatest in the region of the elbow. The whole circumference of the upper third of the arm showed a series of varices. On palpation the œdema was hard and did not take the impression of the finger. In the line of the great vessels there was a tender spot. The general condition was good, the temperature was normal, and minute examination

of the viscera, particularly of the heart, was negative. The limb was put up in a splint. Eleven days later the varices had disappeared in an œdema which was a little more marked. Six weeks later the œdema was slightly less, but six days after this it was in the same condition and the patient had to be evacuated.

In several of the published cases of phlebitis due to effort the influence of the latter is doubtful. Here it was undoubtedly the cause. M. Murard adopts the theory of Lenormant that fatigue leads to muscular contractions which are less regular and harmonious and produce dragging and small ruptures of collateral veins at the point of entrance into the main vein, at which points the thrombosis originates. Phlebitis due to effort would thus be a variety of traumatic phlebitis.

STANDARDISATION OF PATHOLOGICAL METHODS.

IN an original article in our present issue Dr. W. d'Este Emery deals at length with the important matter of the standardisation of the Wassermann reaction, suggesting that, whatever the technique employed, the results should be reported in terms of Wassermann units. The value to the clinician of reports in such a form can hardly be exaggerated. A further substantial contribution by the Medical Research Committee to the present-day needs of pathologists and through them to clinical medicine, appears in the series of Special Reports (No. 19), which contains two memoranda of the Committee upon the Standardisation of Pathological Methods. The first of these deals with the laboratory diagnosis of gonococcal infections, in which the assistance of Lieutenant-Colonel L. W. Harrison, R.A.M.C., has been available. After enumeration of the localities to be examined for the presence of gonococci, methods are recommended for their microscopic identification and cultivation. Jensen's modification is preferred to the original Gram's method, and an excellent coloured plate is given of the appearances of gonococcal pus thus stained. For the cultivation of the gonococcus three media have been found eminently satisfactory in a series of comparative tests made by Captain David Thomson, R.A.M.C., at the Military Hospital, Rochester-row, London. These are (1) Thomson's human plasma-glucose agar; (2) Cole's tryptic blood agar; and (3) Gordon and Hine's trypsinised pea-extract agar. Full details of preparation are given in an appendix. Caution is enjoined in regard to the production of a focal reaction by the employment of a gonococcus vaccine or by the introduction into the urethra of a solution of silver nitrate for diagnostic purposes. Much space is given to a full consideration of the complement fixation test. Four methods have been selected, and they are described in the actual language of their originators. The first, taken from the *American Journal of Medical Sciences*, is the method of Schwartz and Meheil; the second, quoted from the *Journal of the Canadian Medical Association*, is the method of Major J. J. Ower, C.A.M.C.; the third is Kolmer's method, and is abstracted from Dr. Kolmer's "Practical Text-book of Infection, Immunity, and Specific Therapy"; the fourth method is communicated to the committee by Captain Thomson, who carried out the work at the Military Hospital, Rochester-row, under Colonel Harrison. This test promises well as an aid to the diagnosis of gonococcal infections, and the committee have acted wisely in bringing together within one cover the methods employed by those who have most closely studied the subject. The second report deals with methods for the detection of spirochætes. The subject is a more familiar one, and perhaps on this account less attention has been paid to clarity in choice of language and illustration. Dark-ground illumination is described, as well as the methods for staining spirochætes or rendering them visible by the Indian-ink, Congo-red, and silver-nitrate methods. The two reports will fill a gap in the working bookshelf of laboratory investigation of venereal disease.

SANITARY INSTRUCTION IN CHICAGO.

THAT our American Allies are fully alive to the importance of sanitary instruction as a means of safeguarding the people's health is proved in the case of Chicago, the health department of which city issues weekly a bulletin showing the mortality from several important diseases in a population exceeding 2½ millions. The data in the present bulletin refer to the several months of the current year up to and including August. The bulletin sets forth the remarkable fall in mortality in the first eight months of this year in contrast with that of the corresponding period of 1917. The life saving is represented by a total of 3835 persons. Dr. John Dill Robertson, the Commissioner, presents a table showing the deaths from pneumonia and from what he terms the chief degenerative diseases—viz., cancer, diabetes, cerebral hæmorrhage, organic heart disease, cirrhosis of the liver, and chronic nephritis. He also gives the relative "morbidity" from the principal diseases. In the eight months of the present year there were 1167 fewer deaths from pneumonia, representing a reduction of 31·2 per cent., as compared with the mortality from this cause in the corresponding period of last year. Although the rates now given are not strictly comparable with the rates of a full 12-month period, they are instructive as showing the remarkable reduction in mortality recently achieved. The degenerative diseases taken together caused 297 fewer deaths in the eight months under notice as compared with the same period of last year. Indeed, all the diseases of this category showed decrease, with the single exception of cancer, which, in Chicago as elsewhere, is regarded as the *bête noire* among diseases, being less amenable than other conditions to sanitary control, in spite of the intensive study now devoted to its nature and causation. Dr. Robertson draws attention to the necessity of early resort to surgery as the one hopeful means of arresting the condition when once its existence has been ascertained. If the war goes on it is inevitable that America will have to face enormous losses among her soldiers; and as these losses can only be made good from the ranks of the children now being reared, it is imperative that measures should be taken to save the infant lives which are now being needlessly sacrificed. The Chicago weekly bulletin does good service by pointing out these ancient truths to the public. When the public knows that many thousands of infants who now die might be saved by certain well-known preventive methods, and that much of the waste of infant life occurs in the early days after birth, because of the lack of suitable care of the mother before and during confinement, it is certain that well-devised efforts to remedy such scandals will be witnessed. It is the duty of the constituted authorities to convince the public of the necessity of saving young life by pre-natal and obstetrical care for the mother, and the bulletins of the Chicago health department are excellently drawn up for this purpose.

DISPENSARY SUPERVISION IN PULMONARY TUBERCULOSIS.

BY GEORGE JESSEL, M.A., M.D. OXON., D.P.H.,
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THE interim report of the Departmental Committee on Tuberculosis contains the following passage:—

"It should, however, be borne in mind that a short stay in an institution in which the patient may be educated, followed by a course of home treatment in shelters, &c., under close supervision is a form of sanatorium treatment which has certain advantages and which may be successfully adopted in a large number of cases."

Home treatment was, of course, prior to this report the principal if not the only form of treatment in the great majority of cases, but the element of close supervision was probably rarely exercised except as regards the middle and upper classes; furthermore, there is reason to believe that the precise manner in which this supervision should be exercised was not generally understood, even in cases where the family doctor was able to enforce a discipline which is admittedly irksome to many patients.

The aim of this paper is to indicate in some degree the value, both to patient and doctor, of systematic dispensary supervision as exercised from Wigan, over an area of about 40 square miles, for over five years.

Criticisms of Home Treatment.

There are still some who condemn home treatment as dangerous and impossible, and figures are from time to time brought forward which are intended to prove this conclusion. Thus, Dr. O. M. Holden has recorded a series of 1956 patients, of whom 794 gave a definite history of tuberculosis occurring amongst 1081 intimate members,[1] and more recently[2] he has published additional figures, the purport of which is to show that home treatment is a menace to the other inmates of the house. Holden's figures, however, as they stand by no means make out a case against home treatment. Alleged secondary cases occurred in about two-fifths of his first series, and the alleged secondary infection affected only 1¼ of a family out of the average 4¼. In addition, Holden apparently ignores all the other factors—viz., second cases occurring from the same source as the original case, or from quite other sources as the result of insufficient or improper feeding, insanitary homes, overwork, intemperance, individual susceptibility, &c. Furthermore, the total number of individuals (suffering and non-suffering) in the families concerned is omitted.

Holden's figures are thus inconclusive and of little scientific value. Even if they could stand the test of close examination, it would still be necessary to show that in the families concerned that element of close supervision, without which home treatment is admittedly often useless and dangerous, was present. In the experience of the writer secondary cases in the same home are by no means common where supervision is exercised in the home. This, indeed, is what would be expected in the light of modern knowledge. Apart from individual cases of unusual susceptibility, massive infection and lowered resistance are the principal factors in the causation of secondary cases of tuberculosis. Dispensary supervision, if properly applied, will usually effectively counteract these elements.

Home Treatment in Wigan.

Although no case has been made out against home treatment on the ground of danger, the question may fairly be asked whether there is any proof that patients suffering from phthisis can have their immediate surroundings and way of living brought into any reasonable degree of accord with sanatorium practice, this being of course, the aim of home treatment. Sir William Osler has tersely summed up the essentials of treatment as "education, control, and a rigid regimen," and it is essentially in these directions that the efforts of the general practitioner can be assisted at, and in connexion with, the dispensaries.

The problem of sleeping accommodation is often a very difficult one, and it is usual to find the patient in bed in the kitchen at the first visit of the dispensary staff after a case has been notified. Similarly, patients are found to be very careless with their sputum. It is necessary to conclude either that clear and definite instructions on these and kindred topics have not been given by the medical attendant or that, if given, they have not been enforced. The improvements that were effected by three of the dispensary nurses of the Lancashire County Council in 1915 with regard to 361 new cases have already been published.[3] They may be summarised as follows:—

Results obtained by Three Dispensary Nurses in 1915.

—	(A)	(B)	(C)	Total.
On nurse's first visit	157 = 43·49%	57 = 15·78%	147 = 40·72%	361 cases.
,, last ,,	262 = 72·57%	53 = 14·68%	46 = 12·74%	

Results obtained by Four Dispensary Nurses in 1916 and 1917.

Results in 1916 ..	799 = 68·8%	186 = 15·9%	179 = 15·3%	1164
,, 1917 ...	1150 = 70·26%	286 = 17·7%	179 = 11·08%	1615

(A) Separate bedroom—i.e., complete isolation. (B) Separate bed, not separate bedroom—i.e., partial isolation. (C) Not satisfactorily isolated.

That this was no spasmodic effort is shown by the results obtained by four dispensary nurses in the Wigan area during 1916 and 1917. Thus in 1917 complete isolation was obtained in over 70 per cent. of 1615 cases of phthisis occurring in an average industrial area of Lancashire, while partial isolation was obtained in an additional 18 per cent. It is clear that the dispensary nurses have accomplished a great work as the result of tact and perseverance. Home treatment is thus possible and safe in about 70 per cent. of cases occurring in the industrial areas of Lancashire at any rate, and the remaining 11 to 15 per cent., which were not satisfactorily isolated, is a measure of the need for isolation and treatment in hospitals as distinct from sanatoriums.

The Exercise of Dispensary Supervision.

Dispensary supervision is largely exercised through the frequent regular and periodic visits of the nurses to patients' homes. These visits vary in frequency according to the urgency of the need, but cases with active disease are visited without notice at least once a month, and sometimes much more frequently. During 1916 the five dispensary nurses paid 12,308 visits to 2306 cases of tuberculosis (all forms, many quiescent or arrested), and during 1917 13,179 visits to 2722 cases.

This, however, is by no means the only way in which dispensary supervision is exercised. All cases with active disease are examined by me as tuberculosis (consulting) officer once in two to three months, either at home or at the dispensary. When visits are paid to the home it is possible to see that the supervision is being properly exercised and that the advice and instructions given are being carried out. The dispensary nurses report upon each case after every visit, and any difficulties that may be met with can then be conveniently discussed. Patients who are not working and who are fit and able to attend the dispensaries are encouraged to do so every fortnight to get weighed, and to have their temperature records checked.

The supervision is not confined to preventive measures, but also concerned with regard to treatment. Thus, in addition to the provision of paper handkerchiefs and bags for sputum, thermometers and record cards are provided for suitable patients, and the large number of properly kept temperature records is remarkable.

Dispensary supervision is not only exercised by means of direct access to the patients. There is close association with the general practitioners, and every effort is made to work in close accord with them. They receive intimation of place and time of each medical examination, and some regularly attend in consultation in spite of the strain of existing war-time circumstances; otherwise, a letter is sent whenever there is anything to communicate on either side.

In addition to the above, the six care committees are of the greatest value, as has been elsewhere described,[4] in rendering home treatment possible by the provision of nourishments, clothing, bedsteads, bedding, &c., and many of the cases are visited by a member of the committee. Patients thus have additional encouragement and inducement to carry out their treatment properly. There is a growing list of patients receiving dispensary supervision only—i.e., patients whose disease is arrested or quiescent. These are kept under surveillance by occasional visits or communications.

Elements of Success.

It is clear that the success of dispensary supervision depends upon the close attention to detail that is given with regard to each individual case. Every patient needs special consideration and must be studied in relation to his environment. Dr. Pratt, of Boston, U.S.A., has achieved no little success by means of close supervision exercised in connexion with his "tuberculosis class." Thus, during the years 1906 to 1913, 165 patients were discharged, 35 of whom had tubercle bacilli in their sputum at some stage of the illness. In 1915, 58·2 per cent. were well and working, free from all symptoms of disease. Of the 35 cases in which tubercle bacilli were found, in 1915 74·3 per cent. were well and working.

In the experience of the writer, efficient dispensary supervision has resulted in a considerable measure of success in spite of the fact that a large proportion of the cases come under notice when already in an advanced stage of disease. There is every reason to believe that with earlier diagnosis and notification, home treatment under close supervision, such as apparently can usually only be obtained through the dispensary organisation, will fully justify on a large scale the conclusions of the Departmental Committee.

References —1. Holden: Medical Officer, Feb. 28th, 1914. 2. Idem: British Journal of Tuberculosis, April, 1918. 3. Jessel: British Journal of Tuberculosis, April, 1916. 4. Idem: Medical Officer, August 28th, 1915.

THE UTILISATION OF VACCINE FOR THE PREVENTION AND TREATMENT OF INFLUENZA.

AT a Conference on preventive vaccination for influenza held at the War Office on Oct. 14th the following were present: Colonel Sir William Leishman, K.C.M.G., C.B., F.R.S., K.H.P., in the chair; Deputy Surgeon-General P. W. Bassett-Smith, C.B., C.M.G., R.N.; Lieutenant-Colonel D. Harvey, C.M.G., R.A.M.C., officer in charge, Vaccine Department, Royal Army Medical College; Major F. W. Andrewes, F.R.S., R.A.M.C. (T.), pathologist, St. Bartholomew's Hospital; Captain S. R. Douglas, late I.M.S., Inoculation Department, St. Mary's Hospital; Dr. J. W. H. Eyre, Director of the Bacteriological Department, Guy's Hospital. Professor W. Bulloch, F.R.S., pathologist, the London Hospital, was unable to attend.

The Director-General, after welcoming the members, explained to them the object with which they had been called together, and the great and urgent importance of their endeavouring to formulate definite recommendations as to the employment of vaccines, in view of the probability of an extension of the epidemic of influenza.

The committee then proceeded to discuss the items of the agenda form, which had been drawn up by the chairman, and reached the following conclusions:—

1. After discussing the available evidence as to the bacteriology of the present epidemic, the majority of those present were agreed that there was considerable doubt as to the primary etiological significance of the *Bacillus influenzæ* of Pfeiffer, and considered that the existence of some as yet undiscovered virus must be regarded as possible. They had, however, no doubts as to the very frequent presence of Pfeiffer's organism in this epidemic, nor as to the great importance of the part which it played in the production of the symptoms and complications of the disease. The organisms most frequently associated with the *B. influenzæ*, and in their opinion, chiefly responsible for the gravity of the secondary pulmonary complications, are pneumococci and streptococci.

2. The general question of the employment of a bacterial vaccine for the control of the incidence and severity of the epidemic was discussed, and it was unanimously agreed that inoculations with a suitable vaccine might be expected to be of value in both directions.

3. The appropriate constitution of such a vaccine was then thoroughly discussed in the light both of the personal experience of the members of the Conference and of the information available from medical literature. It was agreed that the three following organisms only should be employed, the *Bacillus influenzæ*, the pneumococcus, and the streptococcus. In each instance it was decided that a number of different strains and types of each organism should be utilised in the preparation of the vaccine, and that these strains should have been recently isolated from cases occurring during the present epidemic and should be submitted to strict tests as to race and type prior to use.

4. The relative proportions of the different organisms and the dosage of the vaccine were then dealt with, and it was agreed that the following should be its constitution and dosage:—

	1st dose.	2nd dose.
B. influenzæ	30 millions.	..... 60 millions.
Pneumococcus ...	100 ,,	..... 200 ,,
Streptococcus	40 ,,	..... 80 ,,

The vaccine should be sterilised by a temperature of 55° C., maintained for half an hour, and 0·5 per cent. of carbolic acid should subsequently be added as an antiseptic.

5. Whenever possible, both doses of the vaccine should be given at an interval of 10 days. It was thought that the reactions to be expected from this vaccine would, in the majority of cases, be either trivial or non-existent. It was, however, considered to be of great importance that, in the case of soldiers, a period of 24–36 hours' light duty should always be given.

6. As regards the conditions under which this prophylactic vaccine should be employed, the Conference were unanimous in considering that, whilst it would be preferable to carry out the inoculations before exposure to infection, there do not exist any adequate grounds for withholding it in the case of a body of men amongst whom influenza had already appeared, provided that care was taken not to inoculate any individuals who have fever or are obviously ill, or those who are at the time suffering from catarrh. At the same time, a careful watch should be kept for any evidence of a period of increased susceptibility following upon inoculation, and should this become manifest it is advised that instructions be given to lower the doses recommended above.

7. The Conference made the following recommendations as to dosage of the vaccine in the special cases mentioned below:—

(*a*) *Children.*—It is not advisable to inoculate children under the age of 3. For older children the following doses may be given:—

From 3–7 years	...	¼ of the full dose, as detailed in para. 4.
,, 7–16 ,,	...	½ ,, ,, ,,
Above 16 ,,	...	the full dose ,, ,,

(*b*) *Colonial Troops.*—In this case they recommend three doses at intervals of 10 days, as follows:—

1st dose	...	½ of the "first dose," as detailed in para. 4.
2nd ,,	...	the "first dose," ,, ,,
3rd ,,	...	the "second dose," ,, ,,

(*c*) *Native Contingents.*—Here, too, they recommend three doses at intervals of 10 days, as follows:—

1st dose	...	the "first dose," as detailed in para. 4.
2nd ,,	...	the "second dose," ,, ,,
3rd ,,	...	the "second dose," ,, ,,

8. The Conference then discussed at length the question of employing the vaccine for the treatment of severe cases of influenza and its complications. On this they make the following recommendations:—

(*a*) The vaccine is most likely to be of service in the treatment of subacute and of chronic cases; in this class of case the initial dose which they recommend is 1/5 of the "first dose," as detailed in para. 4.

(*b*) The use of the vaccine in the treatment of severe cases of secondary broncho-pneumonia cannot at present be recommended, in view of the dangerous rapidity and severity of many of these cases. Should it, however, be desired to try the vaccine in such cases it is advised that the initial dose should not exceed 1/20 of the "first dose," as detailed in para. 4.

9. A profitable discussion then followed upon technical details and upon the investigations bearing upon the subject which were felt to be desirable and likely to lead to practical improvements in respect of the employment of vaccine. These hardly admit of summary, but it was agreed that among the most important were the questions of the unity or multiplicity of types of the *B. influenzæ* and of the identification of this organism, and some arrangements were made between the members for exchange and collection of cultures, which it was hoped would lead to progress in these directions.

10. The committee then considered the practical steps to be taken for the preparation of the vaccine on the assumption that considerable demands might be made for it at an

early date. Thanks to the generous assistance offered by the members of the Conference, this was placed upon a satisfactory basis, it being agreed that the numerous strains of the organisms which were in possession of most of the members, and which had been obtained from recent cases, should be sent to Captain Douglas, at St. Mary's Hospital, where he has kindly consented to put them through the necessary tests as to purity, type, &c. Those selected will then be passed on to Lieutenant-Colonel Harvey at the R.A.M. College, who will arrange for the preparation of the vaccine for Army purposes, and also to Deputy Surgeon-General Bassett-Smith at the Royal Naval College.

11. In order to ascertain the degree of protection given by the vaccine the Conference recommend strongly that the necessary administrative steps be taken to secure statistical records dealing with the following matters:—

(*a*) The reactions following the inoculations.
(*b*) The occurrence of any cases of severe illness within 48 hours of inoculation.
(*c*) The incidence of the disease among the inoculated and uninoculated.
(*d*) The incidence of complications among the inoculated and uninoculated.

CONFERENCE OF THE BRITISH HOSPITALS ASSOCIATION.

The Voluntary System and the Ministry of Health

A CONFERENCE of members of this association was held on Oct. 18th at St. Thomas's Hospital under the chairmanship of Mr. H. WADE DEACON, of the Liverpool Royal Infirmary. There was a good attendance, and those present included Sir Arthur Stanley, M.P., Sir George Makins (representing the Ministry of Health Committee of the Royal Colleges of Physicians and Surgeons), Sir Henry Burdett, and the Rev. G. P. Cronshaw.

Sir GEORGE MAKINS proposed the following resolution:—

That the British Hospitals Association welcomes the proposal to form a Ministry of Health. The Association is strongly of opinion that the interests of the patients and of the community as a whole, the progressive education and training of doctors and nurses, and the prosecution and advance of scientific research, will be best served and provided for in the scheme by the retention of the voluntary hospital system.

He said the proposal to form such a Ministry was meeting with the support of the nation and the medical profession alike. The interest of this meeting was mainly in the future of the voluntary hospital system, a system that was one of the links with the past of which the nation had most reason to be proud. In this country the voluntary hospitals had been the home of medical training, and had exerted a great influence in making the general practitioner a highly skilled man. It had been said that a central administration of medical schools would tend to uniformity and increased efficiency. But while something might be said for that view, it would tend to reduce every institution to the same level, possibly a dead level, and they would be cramped and hampered by official administration; and such a change would remove the spirit of emulation between schools and between hospitals which had done so much to advance medical teaching and treatment. During a long life as teacher and examiner he had always felt he gained much knowledge and experience from having come into contact with students from various schools. And a side which he feared would be lost if all hospitals were to be massed under one central administration was the social side, and especially the fine work of the hospital almoner, whose efforts were directed to the patient's welfare after his or her departure from the hospital to insure the best results from the treatment which had been received. The hospitals had done a great work in connexion with maternity and infant welfare and in getting the treatment of tuberculous patients put upon a proper basis. That was largely because these hospitals were individual institutions, free to undertake any enterprise which seemed to promise well; this was less likely to be done by a central administration. Voluntary hospitals owed much of their success to the very strong sympathy which existed between the general public and the charitable aims of the hospitals. He thought the expression "charitable work" ought to be interpreted in the religious sense—not so much a matter of receiving money as one of doing good to others. This feeling of sympathy was the channel along which sentiment was developed into action, and sentiment was, after all, responsible for many of the greatest things which had ever been accomplished.

The Rev. G. P. CRONSHAW seconded the resolution. He said the voluntary hospital principle in this country was the envy of the whole world. America was now trying to get back to it after a trial of the State administration of hospitals; and Australia and New Zealand were coming to the same conclusion. Our hospitals had now to set their houses in order, for they would be required to do something more than in times past. The middle classes were asking very pertinently why only the poorest in the land should have the advantage of specialist knowledge, skill, and equipment. Middle-class people could not afford to pay a specialist, but they could contribute something. The Association would welcome a Ministry of Health, because it would obviate dealing with a variety of different departments according to the subjects concerned. He welcomed also a system by which every doctor would be able to follow his own patients into the hospital. Hospitals could accept money from public funds without losing their voluntary character. In the matter of National Insurance the voluntary hospitals had stood between the nation and the complete collapse of the Act. He looked for the time when nurses engaged on special work could periodically re-enter their hospital for the purpose of keeping themselves up to date.

Sir HENRY BURDETT warmly supported the resolution, and advocated the Association applying for a Royal Charter. There would have to be payment of what were now the honorary staffs of hospitals, especially if the hospitals catered for all classes of the community. He spoke highly of the work of the almoners' department, and thought every hospital should have a medical superintendent, who should, however, have no concern with the finances. In America such an individual received more than he was likely to earn by the exercise of his profession outside, and such posts were very carefully filled.

A number of suggestions were made by various speakers. These included a more extensive hospital propaganda, more working-class representation on hospital boards, the coöperation of large hospital funds, the establishment of pay wards at moderate fees, the organisation of parties of hospital visitors, the throwing of the voluntary hospitals on the mercy of the Charity Commissioners to preserve their character as against the Poor-law institutions which would be taken over by the new Ministry, and the bringing of all hospitals up to a high standard, so that the authorities would be very unwilling to alter them.

Sir ARTHUR STANLEY considered that the meeting was thoroughly agreed that a Ministry of Health would come and that the voluntary hospitals had got to remain. They had nothing to fear from the new Ministry, and Dr. Addison had told him in conversation that those in charge of the Bill had no intention of trying to enforce any particular principle or doctrine of their own. The voluntary hospitals needed a good advocate, and he suggested the formation of a Parliamentary Committee to watch the Bill, for the Association could now claim to represent practically all the voluntary hospitals of the country. He agreed that a Royal Charter, if well and clearly drawn, would be a good weapon for the Association to possess. He made these recommendations with the more freedom as he did not intend to be in the next Parliament.

The resolution was unanimously accepted.

The following further resolution was also passed:—

That the Council be requested, when the terms of the Ministry of Health Bill are known, further to consider the question with reference to its provisions; to take such steps as, at their discretion, they may determine; and report.

The meeting concluded with votes of thanks to the governors of St. Thomas's Hospital for the use of the room, and to the chairman for presiding.

LONDON ASSOCIATION OF MEDICAL WOMEN.—A meeting was held at the Medical Society of London on Oct. 8th, Lady Barrett, the President, being in the chair. The annual report was read, and the new constitution and rules read and approved. Dr. Constance Long read a paper on "The Significance of Phantasy in the Production of the Psycho-neuroses." A discussion then followed, in which Dr. Helen Boyle, Dr. Jessie Murray, Dr. Mary Bell, and Lady Barrett joined.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

A MEETING of the Executive Committee of this Fund was held at the offices of THE LANCET on Monday, Oct. 21st, Sir RICKMAN GODLEE being in the chair.

The HON. SECRETARY reported that the 12 City Livery Companies had been approached with a request for financial help. No answers had been received from four of the Companies, and in the case of the remainder the reply amounted to a qualified refusal in all except one.

The munificent gift of £200 monthly from the American Red Cross was gratefully acknowledged by the Committee. Mr. Ernest P. Bicknell, Commissioner for Belgium of the American Red Cross, wrote to the chairman in August last announcing this intention, and asking to be kept informed of the progress of the Fund. A statement of the activities of the Fund and its existing position having been sent to him by the Hon. Secretary, a letter was received from the American Red Cross confirming the subsidy of £200 per month to the Fund until the end of the year, and alluding to a possibility of its continuance for a longer period. The Committee, while acknowledging with gratitude this magnificent gift, felt certain that the British medical and pharmaceutical professions would continue to contribute their share to the Fund.

In regard to the new situation created by the Allied advance, Sir RICKMAN GODLEE understood that local Belgian Committees would continue to act in the regained territory, although doubtless the need would not be so urgent as in the parts of Belgium still occupied.

The HON. TREASURER presented an audited cash statement from Dec. 1st, 1917, to August 31st, 1918, showing that £3924 0*s.* 3*d.* had been expended in relief and £161 0*s.* 7*d.* in administration, including the cost of the recent Special Appeal, leaving a balance in hand of £1289 17*s.* 1*d.* He added that the first part of the Second Appeal in the New Year had brought in about £963; the circular letter to the medical profession then produced a further £1715; and a special article in the medical press £1455; a total of about £4134—a sum exceeding the auditors' statement, inasmuch as £286 had been subscribed since Sept. 1st. The monthly payments, which began in May, were bringing in £16 3*s.* 6*d.* per month.

It was decided to continue to send to Belgium a mensuality of £400 a month until the end of the year.

URBAN VITAL STATISTICS.

(Week ended Oct. 19th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality was 20·7, against 12·6 and 15·1 per 1000 in the two preceding weeks. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 20·1, or 6·2 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 5·4 in West Bromwich, 6·0 in Smethwick, and 6·4 in Rotherham, to 46·0 in Birkenhead, 46·2 in Liverpool, 48·3 in Gloucester, 58·3 in Southampton, and 63·6 in Portsmouth. The principal epidemic diseases caused 212 deaths, which corresponded to an annual rate of 0·7 per 1000, and included 89 from infantile diarrhœa, 61 from diphtheria, 20 from whooping-cough, 16 from measles, 15 from scarlet fever, and 11 from enteric fever. The deaths from influenza numbered 1895 and included 371 in London, 215 in Liverpool, 178 in Portsmouth, 81 in Southampton, 71 in Hull, 69 in Sheffield, and 62 in Cardiff. The 1241 cases of scarlet fever and 1205 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 93 and 23 above the respective numbers remaining at the end of the previous week. The causes of 55 deaths in the 96 towns were uncertified, and included 21 in Liverpool, 5 in Birmingham, and 3 each in Portsmouth, Hull, and South Shields.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 28·3, against rates steadily increasing from 10·6 to 24·7 per 1000 in the five preceding weeks. Of the 1303 deaths from all causes, 63 were classified to influenza, which was also stated as a contributory cause in 426 deaths classified to other diseases; in the previous week these numbers were 45 and 339 respectively. The 820 deaths in Glasgow corresponded to an annual rate of 38·4 per 1000, and included 10 from whooping-cough, 5 each from diphtheria and infantile diarrhœa, and 1 from measles. The 83 deaths in Edinburgh were equal to a rate of 13·0 per 1000, and included 2 from whooping-cough and 1 each from scarlet fever and diphtheria.

Irish Towns.—The 296 deaths in Dublin corresponded to an annual rate of 38·6, or 14·0 per 1000 above the rate recorded in the previous week, and included 8 from infantile diarrhœa, 4 from whooping-cough, and 1 from diphtheria. The 83 deaths in Belfast were equal to a rate of 11·0 per 1000, and included 5 from infantile diarrhœa and 2 each from scarlet fever and diphtheria.

Correspondence.

"Audi alteram partem."

A NEW TYPE OF INFLUENZA.

To the Editor of THE LANCET.

SIR,—Surely we are seeing a type of influenza quite different from anything we have seen before. Side by side with influenza of the ordinary type we are meeting with cases which exhibit the following symptoms and physical signs. Within a few hours of seizure the patient's temperature runs up to 105° or over, while the pulse ranges round 90; a high temperature with a slow pulse; the lips and face exhibit marked cyanosis, and epistaxis frequently occurs. In the course of a day or two the patient begins to spit up a quantity of frothy sputum tinged with bright blood. In spite of the fever the pulse is regular, of good volume, and fairly strong, and the rate is generally below 100, at times below 90. On examination the area of cardiac dullness is not increased, and there is no evidence of distension of the right side of the heart. For the first day or two the physical signs in the lungs are very indefinite and point to capillary bronchitis rather than to a bronchopneumonia; later on there may develop signs of patches of consolidation. During the past six days among a large number of patients I have seen about a dozen cases such as I have described. In two instances I have seen the changes exhibited on the post-mortem table. In both cases the lungs were emphysematous and showed signs of recent pleurisy. Scattered patches of purpura were present. On section patches of capillary bronchitis appeared to surround small patches of consolidated lung, which sank in water; distinct areas of hæmorrhage into the lung tissue were present. I well remember the severe epidemic in 1889-90, and attended a large number of cases, but the signs and symptoms to which I refer, and which have been exhibited by patients I have attended during the past few days, are quite new to me.

Are we dealing with a new organism or with the recognised organisms of influenza which have for some reason attained greater virulence?—I am, Sir, yours faithfully,

Oxford, Oct. 23rd, 1918. WM. COLLIER.

NASO-PHARYNGEAL INFECTION AT THE ONSET OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—I do not intend to be drawn into a long correspondence upon side issues. If, however, you think that the scientific basis of the discussion has any general interest I will re-state my case shortly and, I hope, clearly as follows:—

Origin of discussion.—Statement made by Lieutenant-Colonel M. H. Gordon: "Every case of cerebro-spinal fever is ..... an instance of a carrier developing the disease." This was a statement of epidemiological importance. Exactly similar views were also held by two authorities quoted by Surgeon S. L. Baker and myself in No. 17 of the Special Report Series of the Medical Research Committee.

Cause of the discussion.—Observations made by Temporary Surgeon Baker and myself published in THE LANCET of Oct. 20th, 1917. These had the effect of disputing the scientific accuracy of the above statement of Colonel Gordon.

1. Twenty-six cases of cerebro-spinal fever were swabbed before the onset of the disease. All were negative. The number has since mounted to 43.

2. Four hundred and eighty-five proved carriers failed to develop cerebro-spinal fever. The number has since mounted to about 700. These carriers were both chronic and transient.

Beginning of the discussion.—Statement in a letter to THE LANCET by Colonel Gordon that we had misunderstood him. We thought we had not, and therefore did not reply, to avoid a polemic.

Outbreak of polemic.—Letter by Major J. Dorgan to THE LANCET nearly a year later, also disputing Colonel Gordon's statement. In the course of his argument he made, independently, exactly the same points as we did and another point relating to the presence of meningococci in the throat *after* the onset of the disease. On this matter we agree with Colonel Gordon rather than with Major Dorgan, but not for the reasons Colonel Gordon advanced and against which I protested in THE LANCET of Sept. 14th.

I am interested only in seeing the idea established that cerebro-spinal fever develops almost immediately upon the occurrence of a naso-pharyngeal infection. If it does not develop immediately it does not develop at all, and the man either becomes a carrier or recovers from the local infection. This seems to me to be quite a different idea from that expressed by Colonel Gordon. He, recognising that the coccus is nearly always to be found in the throat at or shortly after the onset of the disease, says that this implies that the disease has developed in a carrier, and maintains this view against us by saying that he purposely did not bind himself to the *length of time* during which the case had carried; it might have been a very short time, say 24 hours.

This, however, in our opinion, is a totally abnormal and incorrect use of the word "carrier." You do not call a man an "anthrax carrier" during the interval between infection and the appearance of the first signs, nor a man a "pallida carrier" during the incubation period of the disease. Neither can you call a man a "meningococcus carrier" between the time of acquisition of the coccus and the onset of meningitis. If you do, it appears to us to be a confused concept or a quibble. At any rate, it is liable to lead to justifiable misconception.

I am, Sir, yours faithfully,

P. FILDES,
Staff Surgeon, R.N.V.R.

R.N. Hospital, Haslar, Sept. 22nd, 1918.

MEDICAL MEN IN PARLIAMENT: CAPTAIN DONALD CAMPBELL'S CANDIDATURE.

To the Editor of THE LANCET.

SIR,—I have been officially adopted as prospective Parliamentary candidate for North Paddington at the next General Election by the Paddington Branch of the National Federation of Discharged and Demobilised Sailors and Soldiers.

I would like to appeal to my medical brethren for funds to enable me to carry out my political campaign fully and bring the whole to a successful issue. I would respectfully suggest that if a thousand medical men contributed 5*s.* each (as a single, limited, and non-recurring subscription) it would produce £250. Of course, this will be nothing near what it will cost me, but, on the other hand, it will help towards my election expenses, and at the same time be a source of moral comfort during the strain of the elections.

I have done a good deal of spade-work in my constituency, and have a large and weighty following (outside the profession), and with my political experience I am convinced that anyone contesting North Paddington purely as a "medical candidate" would not have the slightest chance of election, and further, in my opinion, of even being reimbursed his £150.

I am willing to speak before any medical gathering, and if the profession hope and intend that some of their members go towards the constitution of the next House of Commons I submit something concrete should be done immediately. Failing this, it just means that those of us who get elected to the House purely as politicians, without the blessing and support of our professional confrères, go to the House qua politicians, and the medical profession still remains unrepresented in the sense desired by a large number of the faculty. We want unity; let us show that we do. I am willing to do my share and more than my share.

I am, Sir, yours faithfully,

DONALD CAMPBELL,
Captain, late R.A.M.C.

70, Sutherland-avenue, Paddington, W. 9, Oct. 18th, 1918.

THE PAY OF TEMPORARY R.A.M.C. OFFICERS.

To the Editor of THE LANCET.

SIR,—I notice a fresh appeal is to be made for medical men both in Ireland and England. Those who come up now will, as in no other branch of the service, receive the same pay as those who have borne the heat and burden of the day. The R.A.M.C. is practically the only corps wherein a man has no expectation of increased pay after three or four years' active service. Is it too late to suggest that the only increase in pay since 1914—viz., children's allowances—should no longer be cut in two because of the fact that we are on consolidated pay instead of pay and allowances?

I am, Sir, yours faithfully,

TEMPORARY CAPTAIN.

Oct. 18th, 1918.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeon Lieutenants: R. H. O. B. Robinson, E. G. T. Holden, S. C. Woxthouse.

ARMY MEDICAL SERVICE.

Col. J. Meek retires on retired pay.

ROYAL ARMY MEDICAL CORPS.

Capt. (acting Major) J. Patrick, R.A.M.C. (T.F.), to be temporary Lieutenant-Colonel whilst specially employed.

Temp. Lieut.-Col. H. A. T. Fairbank (Captain, R.A.M.C., T.F.) relinquishes his temporary commission on re-posting.

To be temp. Majors: G. E. Waugh, W. P. S. Branson, F. N. G. Starr.

Capt. E. G. H. Cowen to be acting Major whilst specially employed.

Temp. Capt. W. V. Robinson relinquishes the temporary rank of Major on re-posting.

Temporary Captains to be acting Majors whilst specially employed: E. McCulloch, A. C. Norman, H. M. Gray, H. E. Gamlen.

The rank of Temp. Capt. C. G. Seligman is as now described.

Temporary Lieutenants to be temporary Captains: J. Menzies, S. G. Trail, A. L. White, E. Reavley, F. S. Adams, J. E. Richards.

To be temporary Captains: A. G. Payne, J. B. Orr, F. W. Twort, W. C. Mayo, P. G. Simpson, W. W. Linnington, H. T. Thomson, H. R. Phillips, P. A. Dykes, P. W. Ashmore, G. R. Lawless, F. H. Cooke, W. H. Weir, Temp. Hon. Capt. D. M. Stone, A. Dingwall-Fordyce, F. P. Grove, E. A. Morgan, H. H. Fairfax.

To be temporary Lieutenants: A. R. Wade, W. Anderson, P. P. Galea, J. A. Martin, E. S. Litteljohn, T. Wallace, C. A. Whitfield, R. Walker, R. L. Wilcox, D. C. Macaskill, F. C. S. Bradbury, R. H. Wace, S. G. Platts, C. W. Branson, W. H. Brooks, R. Tilbury, M. J. Gibson, A. J. Beattie, D. J. Crowley, R. F. Higgin, W. H. Croly, J. E. G. Calverley, G. E. Froggatt, F. Campbell, J. Eadie, A. W. G. Clark, B. G. Reynolds, G. S. Ward, M. Wheeler, G. H. Winch, J. D. Russell, W. F. Waugh, J. Shaw, W. L. Stuart, W. H. Jones, C. P. Lankester, G. Holman, J. D. Walker, J. W. Clyne, J. Dwan, M. D'Albon, A. R. Moore, W. Knapp, J. E. Rea, W. F. Murphy, A. S. L. Biggart, H. W. Hackett, A. J. Hynd, J. Craig, E. Walsh, D. I. McNaughton, R. P. Parker, D. Ferguson, B. F. Howlett.

F. N. Smith to be temporary Honorary Captain.

P. A. E. Sheppard to be temporary Honorary Lieutenant.

R. McL. Gibson to be temporary Honorary Lieutenant whilst serving with No. 11 Stationary Hospital.

H. A. Lownds to be temporary Honorary Lieutenant whilst employed with the British Red Cross Society in France.

Officers relinquishing their commissions: Temp. Major E. C. Stabb (having ceased to be employed at the Manor (County of London) War Hospital); Temp. Capt. (acting Major) H. Dudley (on account of ill-health, and is granted the honorary rank of Captain); Temp. Capts. I. Vandandaigue, R. C. Pitt, A. D. Clinch, W. G. Thomas, A. H. Clough. Temp. Lieut. M. Briscoe.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: H. B. Dykes, D. McK. Sutherland, E. N. P. Martland, N. Kietz, R. D. Aylward, W. Eldinow, E. S. Phillips, W. D. Mackinnon, E. J. Coombe, J. Berry, R. F. C. H. Buchanan.

To be Lieutenants: C. C. H. Cuff, J. H. E. Moore and D. A. Dyer (from Leeds University Contingent, O.T.C.), C. D. Hewer (from University of London Contingent, O.T.C.), T. Colley, E. S. Gawne, and F. L. Whincup (from Manchester University Contingent, O.T.C.), B. Sergeant (from Durham University Contingent, O.T.C.).

Hon. Lieut. R. Granam to be Lieutenant.

To be Lieutenants: L. H. Dugdd, G. Whittaker, S. H. Kemp.

Major T. W. A. Daman relinquishes his commission on account of ill-health, and is granted the honorary rank of Major.

Major (Brevet Lieut.-Col.) (temp. Lieut.-Col.) C. Rundle relinquishes his temporary rank on ceasing to be specially employed.

Capt. P. W. Edwards relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

General List.—Capt. T. Graham, M.C., to be acting Major whilst specially employed. Capt. C. S. Lee relinquishes his commission on account of ill-health contracted on active service, and is granted the honorary rank of Captain.

TERRITORIAL FORCE.

Capt. H. A. T. Fairbank is restored to the establishment on relinquishing his temporary commission in the R.A.M.C.

Capt. (acting Major) J. Patrick is now seconded whilst holding a temporary commission in the R.A.M.C.

Capt. (acting Major) A. C. F. Turner to be acting Lieutenant-Colonel whilst in command of a Medical Unit.

Capts. A. M. Davie and W. Scott to be acting Majors whilst specially employed.

Capt. W. B. Secretan is now seconded for duty overseas.

Capt. (Hon. Col.) Sir Thomas C. English is seconded whilst holding a temporary commission in the R.A.M.C.

Capt. W. G. Paget to be Major.

TERRITORIAL FORCE RESERVE.

Capt. (acting Major) E. B. Hinde, from R.A.M.C., to be Captain.

ROYAL AIR FORCE.

Medical Branch.—Lieut. F. H. Wallace to be Captain. H. A. Hewat (late temporary Surgeon, R.N.) is granted a temporary commission as Captain. T. D. J. Augustine Fuller is granted a temporary commission as Lieutenant. Administrative: Lieut. G. G. Coury, V.C., to be temporary Captain whilst employed as Captain.

THE American Red Cross has given £500,000 to the Joint Committee of the British Red Cross Society and Order of St. John "Our Day" Fund.

THE MEDICO-LEGAL SOCIETY.—A meeting of the society will be held at the rooms of the Medical Society of London, 11, Chandos-street, W., on Thursday, Nov. 14th, at 8.30 P.M., when the President, Dr. F. J. Smith, will deliver an address on Pensions and Their Allotment, to be followed by a debate.

The War.

THE CASUALTY LIST.

THE following medical officers appear among the casualties announced since our last issue :—

Killed.

Lieut. D. G. K. Garrett, R.A.M.C., practised in Canada, and came over with the Expeditionary Force.

Capt. E. L. Jones, R.A.M.C., attached Highland Light Infantry, was a student at Guy's Hospital and qualified in 1913.

Capt. W. S. B. Hay, R.A.M.C., attached R.F.A., qualified at Belfast in 1914. For a short time he practised at Belfast, and joined up early in 1915.

Capt. C. L. Dold, R.A.M.C., attached S. Wales Borderers, qualified at Edinburgh in 1914, and joined up on the outbreak of war.

Capt. J. James, R.A.M.C., attached Highland Light Infantry, was a student at King's College, London, and qualified in 1903. He held appointments at the Westminster Hospital, at the Seamen's Hospital, Greenwich, and at the Western Dispensary, London, and joined the R.A.M.C. in 1908.

Capt. J. M. McLaggan, M.C., R.A.M.C., attached Royal Fusiliers, qualified at Aberdeen in 1913, and joined up on the outbreak of war. The award of the M.C. was recorded in THE LANCET of Nov. 13th, 1915, p. 1112.

Drowned.

Capt. D. Burns, R.A.M.C., qualified in Ireland in 1912, and prior to joining the R.A.M.C., was in practice in Dublin.

Lieut. R. J. Bassett, R.A.M.C., qualified in Ireland in November, 1917, and joined up shortly afterwards.

Capt. R. E. Lee, R.A.M.C., qualified at Dublin in 1910, and held an appointment at the Bootle Borough Hospital. Prior to joining the R.A.M.C. on the outbreak of war he was in practice at Blackrock, Dublin.

Major C. W. Duggan, R.A.M.C., qualified at Edinburgh in 1887, and early chose the Army Medical Service for his professional career.

Capt. M. Murphy, R.A.M.C.

Died of Wounds.

Capt. G. M. Cowper, R.A.M.C., attached Dorset Regiment, was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1914, and joined up on the outbreak of war.

Capt. W. B. Jack, R.A.M.C., was educated at Glasgow University, and qualified in 1905. He held an appointment at the Glasgow Royal Infirmary, and at the time of joining the R.A.M.C. was in practice at Kendal, Westmorland, where he was honorary medical officer to the County Hospital, police surgeon, and medical officer and public vaccinator to the Grayrigg District of the Kendal Union.

Capt. A. A. Parker, M.C., Canadian A.M.C., qualified at Toronto in 1914, and prior to joining the Expeditionary Force was on the staff of the Hospital for Sick Children at Toronto. The award of the M.C. was recorded in THE LANCET of March 23rd, 1918, p. 450.

Capt. J. W. Frew, R.A.M.C., was a student at Edinburgh University and qualified in 1906. He was in practice for some years at Edinburgh, and afterwards proceeded to Barkly East, South Africa, where he was in practice prior to joining up.

Major S. S. B. Harrison, M.C., R.A.M.C., was a student at Guy's Hospital, London, and qualified in 1914. The award of the M.C. was recorded in THE LANCET of May 19th, 1917, p. 776.

Died.

Capt. G. Finch, R.A.M.C. (T.F.), was a student at St. Thomas's Hospital, London, and qualified in 1905. He held appointments at the Royal Westminster Ophthalmic Hospital, London, and at the Brompton Consumption Hospital, and was at one time school medical officer to the East Sussex County Council. At the time of going on active service he was assistant M.O.H. of East Suffolk. He died at Basra, Mesopotamia, of pleuro-pneumonia.

Lieut. E. H. Glenny, R.A.M.C., was a student at St. Bartholomew's Hospital, London, and qualified in July, 1917, and joined up forthwith. He died of pneumonia.

Capt. G. S. Brock, I.M.S., qualified in Edinburgh in 1910, and before joining the I.M.S. in 1912 he was in practice with his father in Rome.

Col. G. H. Van Zyl, South African Medical Corps, died at Wynberg from pneumonia.

Wounded.

Lieut. W. Hickey, R.A.M.C., attached East Surrey Regt.
Capt. F. B. Day, Canadian A.M.C.
Lieut.-Col. M. R. Taylor, D.S.O., R.A.M.C.
Capt. A. Wilson, R.A.M.C.
Lieut. H. G. D. Mathur, I.M.S.
Capt. A. L. McLean, Australian A.M.C.
Capt. R. F. Matters, Australian A.M.C.
Capt. I. D. Stubbs, R.A.M.C., attached London Regiment.
Lieut.-Col. W. W. Boyce. R.A.M.C.
Capt. W. A. Coats, R.A.M.C.
Capt. W. E. R. Dimond, R.A.M.C.
Capt. S. Hodgson, M.C., R.A.M.C., attached R.G.A.
Capt. M. L. Farmer, R.A.M.C., attached R.F.A.
Capt. G. Moore, R.A.M.C., attached Worces. Regiment.
Lieut. F. L. Richard, R.A.M.C., attd. S. Staffordshire Regt.
Capt. F. N. K. Falls, Canadian A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Major W. Y. Hunter, Canadian Infantry, killed in action, son of the late Dr. W. Hunter, of Margate.

Second Lieut. F. B. Atkinson, R.F.A., killed in action, younger son of Dr. J. A. Atkinson, of Newnham-on-Severn.

Lieut. E. C. Comley, M.C., Royal Munster Fusiliers, accidentally killed, son of the late Dr. J. M. Comley, of Calcutta.

Second Lieut. B. Daunt, Royal Sussex Regiment, killed in action, eldest son of Capt. W. Daunt, R.A.M.C., of Hastings.

Major J. C. L. Young, Alberta Regiment, killed in action, son of Lieut.-Col. J. Young, R.A.M.C., of Alexander-square, London, S.W.

Capt. D. C. B. Cotes, North Staffordshire Regiment, died of wounds, only son of Dr. D. F. B. Cotes, of Burton-on-Trent.

Capt. G. S. Brock, I.M.S., died at Rawul Pindi, India, only son of Dr. G. S. Brock, of Rome.

Lieut D. R. Campbell, R.N., drowned at sea, younger son of Dr. D. Campbell, of Brixton-hill, London, S.W.

THE HONOURS LIST.

The following awards to medical officers are announced. All are members of the R.A.M.C. except where otherwise stated :—

Distinguished Service Order.

Temp. Capt. WILLIAM GRAHAME COBB, attached K.A.R.—For conspicuous gallantry and devotion to duty in action. For six hours, in the middle of a desperate fight at close quarters, he maintained his dressing station and attended the many wounded. Enemy's fire was coming from three directions, and the only cover was two ant-heaps. He frequently went forward to the firing line and brought in wounded at great personal risk. He undoubtedly saved many lives by his perseverance and determination, all the wounded being safely evacuated under the greatest difficulties.

Temp. Capt. (acting Major) JOHN GREENE, M.C.—For conspicuous gallantry and devotion to duty during an enemy attack. Although his advanced dressing station was heavily shelled and gassed he continued at duty, encouraging all by his courage and resourcefulness. He worked continuously for 30 hours, visiting his bearers' posts under heavy shell fire, and only rested when all wounded had been evacuated. His magnificent devotion to duty saved many lives.

Second Bar to the Military Cross.

Temp. Capt. (acting Major) DANIEL MCKELVEY, M.C.—For conspicuous gallantry and devotion to duty as liaison medical officer. He constantly kept touch with brigade and battalion headquarters, moving over roads and ground exposed to heavy shelling. His tireless energy, organising ability, and disregard of danger were largely instrumental in the successful clearing of casualties from the line.

Bar to the Military Cross.

Capt. VERNON CARLISLE BROWN, M.C., Australian A.M.C.—For great courage and resource in evacuating wounded from a forward area. The routes were being heavily shelled, and he established bearer relay posts in suitable positions after a full reconnaissance of the ground. During the whole operation his perseverance and initiative contributed largely to a quick evacuation of the wounded, while his energy and example stimulated the men.

Temp. Capt. JOHN CHARLES BOILEAU GRANT, M.C.—For conspicuous gallantry and devotion to duty. He attended to wounded men lying in the open under heavy fire, and subsequently for three days and nights, with little rest, he was constantly out with stretcher-bearers searching for and removing the wounded. He was undoubtedly the means of saving many lives, and his fine example was of the greatest value at a very trying time.

Temp. Capt. JOHN NELSON HUMPHREY, M.C.—For conspicuous gallantry and devotion to duty during an enemy attack. As bearer officer he repeatedly led his men up to the front line under very heavy fire. When the normal line of evacuation was broken he carried out a reconnaissance in full view of the enemy, and established a new means of communication, himself assisting to remove a tree across a road which was being heavily shelled. By his courage and resource he contributed largely to the rapid evacuation of the wounded, and saved many lives.

Temp. Capt. CHARLES CLOUSTON IRVINE, M.C.—For conspicuous gallantry and devotion to duty. When the shelter in which he was working received a direct hit from a shell, the explosion of which killed his sergeant and an orderly who were helping him, he was severely shaken but rallied himself and continued to attend to the wounded. A panic which might have ensued among the wounded and shell-shocked soldiers was averted by his courage and determination.

Temp. Capt. **WILLIAM GRAEME DENROCHE McCALL, M.C.**—For conspicuous gallantry and devotion to duty. When the enemy put down a heavy barrage, causing many casualties in his own and other units, he arranged for the collection of wounded, and attended them with the greatest coolness in the open, which necessitated his remaining in the barrage. Throughout the operations his energy and devotion to duty were admirable.

Capt. (acting Major) **CAMPBELL McNEIL McCORMACK, M.C.**—For conspicuous gallantry and devotion to duty. During an important engagement he organised the evacuation of the wounded with great skill and devotion to duty, proceeding frequently himself in charge of bearers, through heavy shelling, to the rear aid-posts. It was largely due to his able organisation and fine example of self-sacrificing gallantry that the numerous casualties were evacuated so expeditiously.

Military Cross.

Capt. (acting Major) **GALVIN ALEXANDER ELMSLIE ARGO.**—For conspicuous gallantry and devotion to duty. While in charge of a light section of a cavalry field ambulance during an attack he performed most useful work. His brigade sustained considerable casualties, and he organised a stretcher party and rescued several wounded, though the ground was being shelled at the time. He showed great coolness and devotion to duty.

Capt. **ISAAC MANLY BARROW**, Australian A.M.C.—Under heavy fire he dressed wounded in an open trench, and when the battalion attacked he advanced with them and established his dressing station behind the front line. When two of his bearers were wounded carrying a casualty he dashed forward under direct machine-gun fire to their assistance. Later he was severely wounded. Throughout the operations he showed conspicuous gallantry and devotion to duty.

Capt. **GEORGE ALBERT BLUMER**, Australian A.M.C.—For conspicuous gallantry and devotion to duty. When the R.A.P. was heavily shelled, a direct hit causing casualties amongst the staff, he succeeded, single-handed, in getting the wounded away, and attended to many cases in the area of the bombardment. Throughout the period his courage and devotion saved many lives.

Temp. Capt. **STANLEY ARTHUR BULL.**—For conspicuous gallantry and devotion to duty in helping under continuous shell fire to dig out several men who had been wounded and buried. He attended men under conditions which demanded considerable nerve and determination.

Capt. **JOHN VICTOR LIVINGSTONE GRANT.**—For conspicuous gallantry and devotion to duty when his ambulance was attacked on the march by enemy aeroplanes. A large ammunition dump at the side of the road was exploded, igniting a lorry loaded with petrol, and the fire spread to the ambulance wagons. He immediately collected men and for two hours worked coolly and fearlessly near the exploding dump, under repeated bombing attacks from aircraft, tending and removing the wounded.

Capt. **ROBERT LAWSON.**—During several days' operations he worked continuously at high pressure under heavy shell fire. His energy and care for the wounded under the most difficult circumstances were beyond all praise, and he showed great gallantry and devotion to duty in organising his bearers and collecting wounded from a heavily-shelled area, thereby saving many lives.

Capt. **BENJAMIN LYON**, Canadian A.M.C.—For conspicuous gallantry and devotion to duty in action. After a charge by two squadrons up a road this officer followed on foot and attended and evacuated the wounded under heavy artillery and machine-gun fire, remaining there until all the wounded were brought in.

Temp. Capt. **HENRY LESLIE MESSENGER.**—For conspicuous gallantry and devotion to duty while an exceptionally heavy shoot was being carried out on a battery. He crossed 400 yards in the open under heavy barrage to attend to a wounded man. On his way he was knocked down by an exploding shell, but in spite of this he proceeded with his duties. He showed great grit and determination.

Capt. **WALTER JAMES ELLIS MINGIE**, Canadian A.M.C.—For conspicuous gallantry and devotion to duty during an attack. He maintained close touch with all the regiments, and under heavy shell and machine-gun fire he evacuated all casualties with wonderful rapidity. Hearing that an officer was seriously wounded in the front line trench, he immediately went forward and succeeded in dressing and removing him. He showed the greatest coolness and resource throughout.

Temp. Capt. **STANLEY ANDREW WOOLLASTON MUNRO.**—He organised his advanced dressing station and stretcher-bearing parties under very difficult circumstances, and when it was found necessary to withdraw the battalion to the original position he reorganised the stretcher-bearers and himself took up a post in the front line where he could better render assistance to the wounded. He also went and bandaged a wounded man who was lying in a position that was being shelled and had him conveyed to safety. Throughout his cheerfulness, energy, and disregard for his own personal safety had a most inspiring effect on all.

Temp. Capt. **ANDREW NEILSON.**—For conspicuous gallantry and devotion to duty when a number of wounded were left after a cavalry charge. He took two light ambulances and a bearer party right up to the front line and cleared five wounded lying out in front. This was done under continuous machine-gun fire directed on the road in the dark. He showed great courage and initiative.

Temp. Lieut. **WILFRED PATON PHILIP.**—During an attack he showed great gallantry in attending to a large number of wounded. He three times had to move his dressing station on account of shell fire, but stuck to his duties with great determination and saved many lives.

Temp. Capt. (acting Major) **CLIVE JUSTIN HICKS SHARP.**—For conspicuous gallantry and devotion to duty. He most ably supervised the evacuation of wounded during a rapid advance. Moreover, on hearing that one of the advanced dressing stations had been hit by a bomb, he at once went to the spot and helped with the wounded, and his coolness and energy were of the greatest assistance in reorganising the dressing station under shell fire, so that the evacuation of the wounded proceeded uninterruptedly.

Temp. Capt. **JOHN PATRICK SHAW.**—For conspicuous gallantry and devotion to duty. Under severe enemy shelling he carried on his work in the open, his aid-post affording neither space nor protection. He did invaluable service under most trying circumstances, as his was the collecting station both for his own battalion and for the brigade front. He showed magnificent energy and devotion to duty.

Capt. (acting Major) **JAMES MARTIN SMITH.**—For conspicuous devotion to duty when an enemy shell exploded an ammunition dump near his dressing station. He rushed to the spot, organised a rescue party regardless of exploding shells, and continued to attend to the wounded until all were removed to safety. He saved many lives by his gallant conduct.

Temp. Capt. **ANDREW WILLIAM PALETHORPE TODD.**—During an attack this officer, who was stationed at the advanced collecting post, behaved with great gallantry under the heavy artillery fire to which his post was subjected at frequent intervals during the day. He dressed and attended to large numbers of wounded men with unremitting devotion to duty, and also went forward under heavy fire with stretcher-bearers to the aid-posts, and by his able leadership rendered valuable service in evacuating the wounded.

Military Medal.

Dr. PHŒBE CHAPPLE, R.A.M.C., attached Q.M.A.A.C.—For gallantry and devotion to duty during an enemy air raid. While the raid was in progress Dr. Chapple attended to the needs of the wounded regardless of her own safety.

MENTIONED IN DESPATCHES.

In a despatch received from Sir Douglas Haig, dated July 20th, 1918, and dealing with the period following the actions in the vicinity of Cambrai in the first week of December, 1917, and leading up to the set-back to the Allies in March last, the following reference to the medical services is included:—

Much additional work, also under circumstances of unusual difficulty and danger, has necessarily been thrown upon the medical and nursing services. The conduct of the Royal Army Medical Corps and Medical Corps of the Overseas Dominions has again been beyond all praise, while the efficient organisation of the medical services as a whole proved itself fully equal to the occasion. I take this opportunity to acknowledge the lasting debt due in this connexion to Lieutenant-General Sir A. T. Sloggett, K.C.B., K.C.M.G., K.C.V.O., K.H.S., until recently Director-General of Medical Service, with whom the work of the medical services has so long been identified.

Medical News.

UNIVERSITY OF CAMBRIDGE.—The following candidates have satisfied the examiners in both parts of the Examination in Sanitary Science:—

Andrew Grant, Captain, R.A.M.C.; Joan Hardy; William Athol Desmond King, Captain, R.A.M.C.; Aloysius Dominic MacMahon; Mary Helen Routledge; Hilda Mary Scarborough; Percy Stocks; Shankarlal Vaidya; John David Whitfield; and James Herbert Wright, Staff-Surgeon, R.N.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examinations:—

THIRD EXAMINATION.

John Stevenson, John Borrison McCubbing, Agnes Macilwraith Hill, Thomas Poole, Veeravagu Kathiravelu Paramanayagam, Henry Aidan Newton, Daniel Augustine Dias, James Sydney Alexander Rogers, and Walter Granville Carew.

Pathology.—Hamish Russell Fisher.

Materia Medica.—Alexandra Mary Limont and Peter Fraser Fairley.

FINAL EXAMINATION.

Thomas Talmage Read, John Wilson Gaston, Rebecca Goodman, George Thomas Graham Boyce, Don Alfred Walpola, Anup Singh Narula, Apcar Galustian, Sylvester Henry Meiring, John Birchmans Bourke, Arthur Stanley Hughes, and Fergus Donald Yourell.

Medicine.—William Gibb, Victor Albert Rankin, and Krishna Abaji Deodhar.

Surgery.—Victor Albert Rankin.

Midwifery.—Thomas Hardie and William Gibb.

Medical Jurisprudence.—Alexander Forsyth Caddell, Mayberry Hugh Carleton, James Maxwell Adams McVey, Andrew Francis Brigimen, John Stevenson, and Thomas Poole.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Oct. 17th the following gentlemen, having passed the requisite examinations between July 1st and 5th, were admitted Fellows:—

Thomas Hood Wilson Alexander, Jan Martinus Beyers, Edward Stanley Brentnall, Francis Davidson Cairns, Harold Liat Him Lim, Thomas Robert Gray Melrose, George Robertson, Cecil Michell Rolston, Baron Theodore Rose, Thomas Henry Sanderson-Wells, John Zacherias Truter, William Robert Elsteb Unthank, and Batukdeva Prasad Varma.

At the annual meeting of the College Dr. Robert McKenzie Johnston was re-elected President for the ensuing year.

DONATIONS AND BEQUESTS.—By the will of the late Dr. Louis Albert Dunn, of Gerrards Cross, Bucks, the testator left to Guy's Hospital the gold medal presented by London University when he took his degree as Master in Surgery, being the first of its kind ever won by a Guy's man; and the residue of his property in trust for his two brothers for life, with remainder to the survivor for life, with ultimate remainder to Guy's Hospital for the Medical School. The gross value of the estates is £68,000 and the net personalty £56,000.

THE BELL FUND.—Dr. S. A. Kinnier Wilson asks us to acknowledge a donation to the Dr. J. H. Bell Fund of £1 1s. from Dr. H. J. Norman. Subscriptions should be sent to Dr. Wilson, at 14, Harley-street, London, W.1.

MEDICAL SOCIETY OF LONDON.—A meeting of this society will be held at 11, Chandos-street, Cavendish-square, W., on Monday, Oct. 28th, at 8.30 P.M., when papers will be read on "Rheumatoid Arthritis": The Pathology, by Mr. T. S. P. Strangeways; the Treatment, by Dr. A. P. Beddard. Medical officers of the Allied Forces will be welcome at the meeting.

MEMORIAL TO THE LATE DR. FRANCIS MCKEE.—On Oct. 17th a portrait of the late Dr. Francis McKee, of Dromore, co. Down, was unveiled at the Cowan Heron Hospital, Dromore, and a memorial bed was presented to the institution in his memory. Both have been given by Dr. McKee's friends to commemorate his services as honorary surgeon to the hospital from its opening in 1900 to 1915.

THE annual general meeting of the Army and Navy Male Nurses' Co-operation will be held at 52, Welbeck-street, London, W., on Monday, Nov. 4th, at 4 P.M. The honorary treasurer's annual statement reports an improvement in the financial position of the Co-operation.

MEDICAL DEFENCE UNION.—Sir John Tweedy, LL.D., ex-President, Royal College of Surgeons of England, has been again re-elected President of the Medical Defence Union; Mr. Gunton Alderton re-elected honorary treasurer; and Dr. A. G. Bateman and Mr. W. E. Hempson re-elected secretary and solicitor respectively. There have been added to the Vice-Presidents Surgeon-Commander C. T. Baxter, R.N., and Surgeon Lieutenant Commander H. B. Hill, R.N., as representatives of the Navy Medical Staff; the sister Service has been well represented for some years. The annual general meeting was held on Sept. 19th, when the annual report was presented and adopted and the usual statutory resolutions passed unanimously. The work of the Union was reported by the President to have greatly increased owing to the war, and its services have been sought and greatly appreciated by members on active service who required advice and assistance in matters relating to their military appointments and their civil practices.

THE OPENING OF THE WINTER SESSION AT THE BELFAST MEDICAL SCHOOL.—The winter session opened on Tuesday, Oct. 15th, without any formal address at Queen's University, but at the hospital Dr. J. B. Moore gave an introductory address on the students' career and on problems of reconstruction, the solution of which he saw in the direction of cooperative effort, resulting in a life of reasonable comfort and prosperity.—At the Royal Victoria Hospital on Thursday, Oct. 17th, Colonel J. Sinclair, C.B., late Consulting Surgeon to H.M. Forces, gave an address to men and women students in the King Edward VII. Memorial Hall. He referred to the devotion and courage shown by nurses in the war, specially mentioning the sisters and nurses trained at the Royal Victoria Hospital Training School, who, with their superintendent, Miss Bostock, had received the award of the First Class Royal Red Cross, four other Royal Red Crosses, two Military Medals, and four mentions in despatches for services in India, Mesopotamia, Egypt, Salonika, and on the Western fronts. Colonel Sinclair concluded by referring to the shortage of doctors at the front. He urged that a determined effort should be made to fill the ranks, announcing that should a sufficient number of students, academically eligible, at once present themselves he believed the University would grant them a special examination for the purpose.

THE LATE ROBERT A. BUNTINE, M.B., C.M. MELB.—A popular member of the South African Union Parliament, Dr. R. A. Buntine, was among the victims of the torpedoing of the *Galway Castle* off Ushant last month. Dr. Buntine was returning to South Africa from England with his two daughters, aged 20 and 18 respectively. The elder one perished with her father; the younger was among the saved. Dr. Buntine was born in Melbourne 50 years ago, and migrated to Natal in 1893. He took part in the Boer War with the Natal Medical Corps, and went through the siege of Ladysmith, in connexion with which he was mentioned in despatches for distinguished service in the field. A South African correspondent writes: "The doctor was returned to the Union Parliament three years ago as the Member for Maritzburg South. He belonged to General Botha's South African Party, and the Premier spoke of him a sa 'true friend and great help and support.' A man of great kindness of heart, Dr. Buntine sheltered on his farm an old friend of Teutonic nationality at the time of the anti-German riots of 1915 following on the *Lusitania* tragedy. No one will ever know the number of the poor and needy whom the deceased Good Samaritan attended without fee or wish for reward, and even with cost of medicine. His death is deeply lamented in South Africa."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Housing Bill.

Mr. HAYES FISHER (President of the Local Government Board) on Thursday, Oct. 17th, presented in the House of Commons a Bill designed "to confer further powers on county councils in relation to the provision of houses for persons in their employment or paid by them, and to the housing of the working classes." It was read a first time.

The Midwives Bill.

The Midwives Bill has received a third reading in the House of Commons. In Committee Clause 12, which repeals Section 9 of the Midwives Act, 1902, enabling county councils to delegate their powers to district councils, was carried by 60 votes to 38.

Naval and Military War Pensions Bill.

The Naval and Military War Pensions Bill, which was read a second time in the House of Commons on Tuesday, Oct. 22nd, deals with administrative matters and local War Pensions Committees. It was criticised in many details. Clause 7 lays down that if a disabled officer or man refuses or without reasonable excuse fails to submit himself for medical examination, or refuses to undergo the treatment prescribed for him in an institution or otherwise, his pension or allowance may be suspended. Sir WATSON CHEYNE took exception to this provision. Compulsory operations, he said, would require very serious consideration indeed. If the disability were not something which would imperil the man's life the matter should be left to his own free will and judgment without compulsion.

HOUSE OF COMMONS.

THURSDAY, OCT. 17TH.

Venereal Disease and Regulation 40 D.

Mr. LEES-SMITH asked the Home Secretary whether he could now state how many women had been arrested under the Defence of the Realm Regulation 40 D; and in how many cases convictions had been obtained.—Sir G. CAVE replied: Up to Oct. 8th there had been 201 prosecutions under the regulation. Convictions had been obtained in 102 cases, in 51 of which the defendants pleaded guilty. Three other defendants were bound over or placed on probation, and six cases were under remand when the return was made.

Mr. LEES-SMITH: In view of the answer that in nearly one out of every two cases no conviction was obtained, may I ask whether any arrangement has been made to give compensation to the women who have been subjected to this examination?—Sir G. CAVE: I think that the return shows that the magistrates are very careful, and do not convict except in very clear cases.

Mr. DILLON: Will the right honourable gentleman undertake to give the House an early opportunity of discussing this abominable regulation?

Lord H. CAVENDISH BENTINCK: In view of the futility of this Order will the right honourable gentleman withdraw it altogether?—Sir G. CAVE: As a matter of fact, the regulation is being considered by a committee, which will report in due course.

Mr. H. SAMUEL: In view of the very widespread interest in this matter will my right honourable friend endeavour to expedite the report of the committee?—Sir G. CAVE: The committee has been asked to report as soon as possible.

Mr. DILLON: Will the right honourable gentleman allow the House an opportunity of discussing this matter before the committee reports, which may not be until after Christmas?—Sir G. CAVE: That is not a question for me, but in any case it would be very undesirable to have a discussion while the committee is considering the question.

Mr. PRINGLE: Can the right honourable gentleman give the House an assurance that the committee will report before the Prorogation?—Sir G. CAVE: I cannot, of course, do that. The committee has been asked to report as early as possible.

Mr. DILLON: I shall raise this question at the very earliest opportunity.

Mr. LEES-SMITH asked whether the terms of reference of the committee set up to inquire into the Defence of the Realm Regulation 40 D were confined to the modification of the regulation or included also the question of its withdrawal.—Sir G. CAVE answered: The committee was appointed to consider the regulation and what modification (if any) should be made in its terms or in the procedure for enforcing it, and I do not think the committee would be precluded from considering the question of its withdrawal.

Mr. LEES-SMITH: As the committee is considering the question of the withdrawal of this regulation, and in view of the general hostility to it, will the right honourable gentleman have it suspended until the committee has reported?—

Sir G. CAVE: No. The Cabinet has already given a decision on that point.

Mr. ALDEN: If the committee reports against the regulation can the right honourable gentleman in his own person withdraw it?—Sir G. CAVE: I could not. It would have to be rescinded by Order in Council.

Housing in Ireland.

Mr. SCANLAN asked the Chief Secretary for Ireland whether the Government had prepared a scheme for the provision of suitable houses for the workers in the towns and cities of Ireland; whether the Treasury had been requested to support such a scheme; and when the Government would begin to carry out in Ireland a scheme to settle the housing problem.—Mr. SHORTT said in reply: I am not in a position to make any statement on the subject.

Mr. SCANLAN: Has the matter of housing engaged the attention of the right honourable gentleman at all?—Mr. SHORTT: Yes, to a very considerable extent.

Housing Scheme for Lanarkshire.

Mr. DUNCAN MILLAR asked the Secretary for Scotland what progress had been made with the additional housing scheme for Lanarkshire which was some time ago approved by the Ministry of Munitions and the Scottish Local Government Board, and the number of houses which had been allocated to each district.—Mr. MUNRO wrote in reply: Proposals, I understand, have been made by the Ministry of Munitions to the local authorities and are at present receiving their consideration.

MONDAY, OCT. 21ST.

Artificial Limbs for Discharged Soldiers.

Sir MONTAGUE BARLOW asked the Pensions Minister whether his attention had been called to the delay in obtaining repairs to the artificial limbs of discharged sailors and soldiers; whether, in view of the suffering and hardships entailed, he would consider the advisability of having such limbs standardised; and whether he could state how long it was likely to be before he is able to carry out his promise of issuing a spare limb to each man so that he would be able to substitute one while the other was being mended.—Mr. HODGE replied: My attention has been drawn to the delay. A recent instruction which enables local War Pensions Committees to authorise repairs (locally where possible) without previous reference to the Ministry will, it is hoped, obviate delay in minor cases, and, with regard to major repairs and the readmission of pensioners into limb-fitting centres, the increase in the number of beds at fitting centres from 972 in February, 1918, to 2196 in October will enable cases to be more expeditiously dealt with. It has not yet been found possible to standardise limbs, as no specimen brought to the knowledge of the expert Advisory Council has shown such advantages over any other as to warrant it being made the standard pattern. The promise to issue a spare limb to all cases will, I hope, be carried out within a reasonable period, but clearly the primary fitting of limbs must be the first consideration. It is proposed to supply a light provisional peg leg of fibre or other prescribed pattern in all cases for use in emergency. This should obviate inconvenience to men until the spare limb can be provided.

Indian Medical Service.

Colonel YATE asked the Secretary of State for India whether he had received a reply from the Government of India regarding the position of officers in the Indian Medical Service; and what increase of pay had been granted to these officers so as to ensure an efficient and contented Indian Medical Service.—Mr. MONTAGU answered: I regret I am not in a position to announce a decision on this question, regarding which I am in telegraphic correspondence with the Government of India. I am doing all I can to expedite the settlement of what I recognise to be an urgent and important issue, and hope to be in a position to make a statement within a week or two. I will let my honourable and gallant friend know when a decision has been reached.

TUESDAY, OCT. 22ND.

Serious Outbreak of Rabies.

Answering Sir W. BULL, in regard to the spread of rabies amongst dogs in the counties of Devon and Cornwall, Mr. PROTHERO (President of the Board of Agriculture) stated that in all 40 cases of rabies had been confirmed since Sept. 7th—35 in Devon and 5 in Cornwall. Of these no fewer than 29 occurred in the county borough of Plymouth. Seven dogs, which had been in contact with dogs at a place where an outbreak had occurred, had been taken to places outside Devon and Cornwall. These had now all been traced and isolated. It would be seen that grave risk of the spread of this disease to other parts of the country had been thus incurred. The right honourable gentleman proceeded: Human life is at stake in this matter. At least 21 persons are known to have been bitten by these rabid dogs, nine being children, and any person who fails to assist by giving information required by my Department will incur a very grave responsibility should the disease spread to other districts.

An HON. MEMBER: Have any deaths resulted from the bites of these dogs?—Mr. PROTHERO: No, not up to the present.

Fazakerley Sanatorium.

Mr. PENNEFATHER asked the Parliamentary Secretary to the Local Government Board how many discharged men there were in Liverpool who were suffering from tuberculosis caused or aggravated by military service, and unable to secure proper treatment owing to lack of sanatorium accommodation; and what steps would be taken to provide sufficient accommodation.—Mr. WALSH replied: I am informed that the number, which varies from day to day, is approximately 140. As to the provision of further accommodation, my right honourable friend has been taking all practicable steps to expedite the completion of the Fazakerley Sanatorium, and has reason to hope that it will be ready for the reception of patients within the next two or three months.

WEDNESDAY, OCT. 23RD.

Ministry of Health.

Mr. BOOTH asked the Chancellor of the Exchequer whether communications reached him from the Friendly Societies and trade-unions expressing opposition to any proposed Ministry of Health and local government which would place the health insurance department in association with the Poor-law administration, and what answer he had given thereto.—Mr. BONAR LAW replied: I am informed that resolutions have been received from these societies, but I hope that when the Bill has been discussed this opposition will not be maintained.

BOOKS, ETC., RECEIVED.

BLACKIE AND SON, London, Glasgow, and Bombay.
Medicinal Herbs and Poisonous Plants. By David Ellis, D.Sc. 2s. 6d.

P. BLAKISTON'S SON AND CO., Philadelphia.
Details of Military Medical Administration. By J. H. Ford, M.D. 2nd ed.
Medical Bacteriology. By J. A. Roddy, M.D.
Mammalian Anatomy, with Special Reference to the Cat. By A. Davison, Ph.D. 3rd ed., revised by F. A. Stromsten, D.Sc.

BRITISH MUSEUM (NATURAL HISTORY), B. QUARITCH AND DULAU AND CO., London.
Rats and Mice as Enemies of Mankind. By M. A. C. Hinton. 1s.

CONSTABLE AND COMPANY, London.
Fields and Battlefields. By No. 31540. 5s.

GOVERNMENT PRINTING OFFICE, Washington.
The Evolution of National Systems of Vocational Re-education for Disabled Soldiers and Sailors. By D. C. McMurtie.

LAURIE, T. WERNER, London.
Roving and Fighting Adventures under Four Flags. By Major E. S. O'Reilly. 11s. 6d.

LEA AND FEBIGER, Philadelphia and New York.
Military Surgery of the Zone of Advance. By G. de Tarnowsky, M.D. $1.50.

LIPPINCOTT (J. B.) COMPANY, London and Philadelphia.
Equilibrium and Vertigo. By I. H. Jones, M.D., and L. Fisher, M.D. 21s.
A Manual of X Ray Technic. By A. C. Christie, Major, U.S.A. 12s. 6d.
Mastitis of the Cow. By S. Wall. Translated by W. J. Crocker. 12s. 6d.
Applied Anatomy. By G. G. Davis, M.D. 5th ed. 30s.

METHUEN AND CO., London.
Present-day Applications of Psychology, with Special Reference to Industry, Education, and Nervous Breakdown. By C. S. Myers, M.D. 1s.

MILFORD, HUMPHREY, London.
Medical Report of the Rice Expedition to Brazil. By W. T. Councilman, M.D., and R. A. Lambert, M.D. 5s. 6d.

OLIVER AND BOYD, Edinburgh.
Reminiscences of a Student's Life at Edinburgh in the Seventies. By Alisma. 4s.

YEAR BOOK PUBLISHERS, Chicago.
Practical Medicine Series. Edited by C. L. Mix, M.D. Vol. III.: Eye, Ear, Nose, and Throat. Edited by C. A. Wood and Others. $1.60.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—A meeting of this society was held in Manchester on Oct. 18th, Mr. Miles Phillips (Sheffield), the President, being in the chair.—Mr. W. Blair Bell (Liverpool) exhibited specimens of: (1) Carcinoma Corporis Uteri secondary to Carcinoma Mammæ; (2) Carcinoma of the Fallopian Tubes; (3) Hæmatometra in Accessory Uterine Cavity.—The President described: (1) Two cases of Concealed Accidental Hæmorrhage of Toxæmic Origin; (2) a case of Decortication of a Kidney for Post-eclamptic Suppression of Urine.—Dr. W. Fletcher Shaw (Manchester) read notes on: (1) Inversion of the Uterus occurring twice in the first eight days of the puerperium; (2) Ectopic Gestation with well-developed Fœtus free in Abdominal Cavity.—Dr. H. Briggs (Liverpool) read a paper on Placenta Prævia.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

MEETINGS OF SECTIONS.

Monday, Oct. 28th.

ODONTOLOGY (Hon. Secretaries—F. N. Doubleday, G. Paton Pollitt, J. Howard Mummery): at 7.30 P.M.
Presidential Address by Mr. G. G. Campion.
Casual Communication by Mr. George Northcroft.

Friday, Nov. 1st.

LARYNGOLOGY (Hon. Secretaries—Frank A. Rose, Irwin Moore): at 4 P.M.
Cases and Specimens will be shown by:—
Mr. Somerville Hastings, Mr. Woakes, Mr. Hunter Tod, Mr. J. Gay French, Dr. Irwin Moore, Dr. Dundas Grant, Dr. Andrew Wylie, and others.

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish sq., W.
MONDAY, Oct. 28th.—8.30 P.M., Papers on Rheumatoid Arthritis:—Mr. T. S. P. Strangeways: The Pathology; Dr. A. P. Beddard: The Treatment.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
FRIDAY, Nov. 1st.—5 P.M., Museum Demonstration:—Prof. A. Keith: Bone Setting—Ancient and Modern.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Clinics each week-day at 2 P.M., Wednesday, Friday, and Saturday also at 10 A.M.
(Details of Post-Graduate Course were given in issue of Sept. 27th.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Out-patients each day at 2.30 P.M.

NATIONAL ASSOCIATION FOR THE PREVENTION OF CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS, in the Large Hall, 20, Hanover-square, W. 1.
TUESDAY, Oct. 29th—4 P.M., Address:—Prof. S. M. Gunn: Tuberculosis Propaganda Work in France (illustrated by lantern-slides).

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.
Course of Lectures on Public Health Problems under War and After-war Conditions (each Lecture will be followed by a Discussion):—
WEDNESDAY, Oct. 30th.—4 P.M., Lecture IV:—Lieut.-Col. L. W. Harrison, M.B., D.S.O.: The Prevention and Abortive Treatment of Venereal Disease.

Communications, Letters, &c., to the Editor have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Army and Navy Male Nurses' Co-operation, Lond.

B.—Mr. J. Burns, Edinburgh; Dr. A. Breinl, Townsville, North Queensland; Mr. G. Bethell, Lond.; Maggiore Prof. P. Boveri; Dr. A. G. Bateman, Lond.; Lt.-Col. J. W. Bird, D.S.O., R.A.M.C.(T.); Mrs. Cloudesley Brereton, Lond.; Rev. W. H. Bradley, Coleraine; Board of Agriculture and Fisheries, Lond.; Capt. J. Brereton-Barry, Camberley.

C.—Dr. J. B. Christopherson, Khartoum; Lt. Col. N. Cheune, I.M.S.; Central Association for the Care of the Mentally Defective, Lond., Asst. Sec. of; Capt. D. Campbell, late R.A.M.C.; Capt. H. W. Crowe, R.A.M.C.; *Chemist and Druggist*, Lond., Editor of; Chadwick Trust, Lond.; Capt. J. Campbell, R.A.M.C.(S.R.); Dr. F. G. Crookshank, Lond.

D.—Mr. H. Dickinson, Lond.; Mr. A. Dandridge, Beckenham; Capt. F. Dillon, R.A.M.C.

E.—Mr. D. L. Eadie, Edinburgh.

F.—Mr. C. Fitch, Lond.; Capt. P. Figdor, R.A.M.C.; Major N. H. Fairley, A.A.M.C.; Staff-Surg. P. Fildes, R.N.V.R.

G.—Mr. J. W. G. Grant, Cardiff; Mr. H. E. Girdlestone, Peterstield.

H.—Capt. R. Hall, R.A.F.; Mr. J. T. Henderson, Pietermaritzburg; Dr. F. Hall, Makogai; Dr. Howell, Felixstowe.

I.—Capt. A. C. Inman, R.A.M.C.; Institute of Hygiene, Lond., Sec. of; Insurance Committee for the County of London.

K.—Dr. H. C. Kidd, Bromsgrove; Mr. R. Kirkland, Wishaw; Mr. W. H. Kesteven, Kingston Hill.

L.—Col. Sir W. B. Leishman, K.C.M.G., C.B.; Local Government Board, Lond.; Dr. Eleanor Lowry, Lond.; Dr. G. W. A. Lynch, Suva, Fiji; Dr. R. B. Low, Lond.

M.—Dr. H. A. Macewen, Lond.; Mr. G. E. Morgan, Lond.; Dr. W. C. Morton, Leeds; Dr. J. B. Mennell, Lond.; Mr. J. Y. W. MacAlister, Lond.; Dr. A. J. MacCullum, Kendal.

N.—National Baby Week Council; National Hospital for the Paralysed, Lond.; National Egg Collection Committee, Lond.; *National Food Journal*, Lond.

O.—Mr. T. O'Farrell, Dublin; Mr. J. Offord, Lond.

P.—Dr. H. R. Prentice, Lond.; Panel Committee for the County of London; Miss K. Pilkington, Lond.; Lt.-Col. D'Arcy Power, R.A.M.C.(T.); Capt. B. Parsons-Smith, R.A.M.C.; Dr. E. P. Poulton, Lond.; Mr. H. A. Powell, Lond.

R.—Mr. G. A. Riddell, Lond.; Dr. R. R. Rentoul, Liverpool; Mr. H. M. Rainsford, Lond.; Mr. H. Rundle, Southsea; Mr. S. C. Ranner, Lond.; *Revista Odontologica*, Buenos Aires.

S.—Serbian Red Cross, Lond.; Dr. R. I. Spriggs, Banff; Dr. A. Savill, Lond.; Capt. V. E. Sorapure, R.A.M.C.; South Australia, Registrar-General of, Adelaide; St. John's Hospital, Lond.; Miss E. Stuart, Lond.

T.—Mrs. D. Tennent, Lond.

W.—Capt. P. Wood, R.A.M.C.; Dr. A. J. Whiting, Lond.; Mr. A. Winterbottom, Lond.; Dr. F. P. Weber, Lond.; Lt.-Col. J. H. T. Walsh, I.M.S. (retd.); West London Hospital Post-Graduate College, Dean of.

Y.—Mr. M. Yearsley, Lond.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

RACIAL RECONSTRUCTION AND THE PROPOSED MINISTRY OF HEALTH.

SUMMING up the principles which should govern the formation of a Ministry of Health, Dr. C. W. Saleeby, in a lecture on the above subject delivered at the Royal Institute of Public Health, London, on Oct. 16th, said that to learn, to teach, to guard, and to help must be the watchwords. The first heading would embrace a permanent anthropometric department, which would not only deal with physiology and anatomy, but include, as far as possible, a survey of the psychological factors of mind, while something should be done in regard to the selection of proper vocations for the people. There should also be a general up-to-date registry of births and deaths, with information respecting the living, and perpetual medical research. In part at least the Ministry of Health should control the instruction of all those directly concerned with the various aspects of health and healing, while the general public must also be taught if such a Ministry was to be an organisation appropriate to a free people. A watch should be kept on our weaknesses, prejudices, and preferences in regard to food, drink, and other matters, and finally help given by special departments for mothers and babies, and for recreation. We were, he suggested, well on the way to the conquering of Mars and Bacchus, and the next enemy that would have to be dealt with was Mammon. Bradford, which was credited by the lecturer with making so much money that the people did not know what to do with it, was a model city with regard to the provision for mothers and babies, yet the death-rate was 14·6 and the birth-rate 13·2. The logical deduction from these figures was that Bradford was dying out, the reason being that home life had been destroyed. So long as mothers went out to work there were no homes, but the only factor of national safety was the mother in the home and the baby at her breast. Objectives for a Ministry of Health Dr. Saleeby sees in protection from racial poisons, diachylon of lead, alcohol, and, most important of all, the parasite of syphilis.

HOW TO FEED THE FAMILY.

THE Ministry of Food has issued to the public a pamphlet (F.S.B. 27) containing a series of dietaries on which, with extreme economy and the avoidance of waste, health and efficiency may be maintained. Three dietaries are given in detail which work out at a weekly cost per "man" of 14*s.* 10*d.*, 10*s.* 6*d.*, and 7*s.* 5*d.*, or for a family consisting of a man, his wife, and four children from 8–16 years of age at £3 14*s.* 1*d.*, £2 12*s.* 7*d.*, and £1 17*s.* respectively. The pamphlet has been drawn up under the supervision of Professor E. H. Starling, whose name is sufficient guarantee for the accuracy of the physiological value of the foodstuffs in the quantities suggested. The recipes, too, appear to have been well selected and to bear the impress of the practical cook. The pamphlet is, of course, applicable to present conditions, and to present conditions only. With pre-war wages and pre-war prices no married worker was likely to spend £3 10*s.* to £4 a week on food for himself, his wife, and four children. We may recall the figure of 4*s.* 4*d.* given by Mr. B. Seebohm Rowntree in his recent book, "The Human Needs of Labour," as the weekly cost per "man" of a minimum dietary consistent with health on the basis of retail prices ruling in York in July, 1914. Between that date and July, 1918, the date at which the prices in the Ministry of Food's pamphlet are reckoned, the average price of foodstuffs had gone up some 120 per cent., which would bring Mr. Rowntree's figure to 9*s.* 6*d.* Mr. Rowntree admits that his standard errs on the side of economy. Dietary I. of the Ministry of Food is doubtless a little generous, and Dietary III. more than a little skimpy. Dietary II., being the happy mean, at the convenient figure of 10*s.* 6*d.* a week, deserves special attention. Copies of the pamphlet may be obtained gratis on application to the Despatch Section, Ministry of Food, 35, Park-street, London, W. 1.

PUBLIC EULOGY OF THE MEDICAL PROFESSION.

To the Editor of THE LANCET.

SIR,—Referring to the note with the above heading in THE LANCET of June 22nd it may be of interest to recall a somewhat similar eulogy in this small colony of Fiji. A good many years ago the writer was asked to see an elderly Fijian chief afflicted with a painful suppurating external pile. This was treated in the usual way to his great eventual content, subsequent rectal examination being made to determine if internal piles were also present. The old gentleman subsequently described what had occurred, to the resident magistrate, in the following words: "The doctor came and removed my entire intestines, placed them

on a plate (which, as your note says, is apparently necessary, and is so out here also), washed them, and returned them to their place." He then turned to his native henchman for confirmation of the story, and obtained loyal support for it.

I am, Sir, yours faithfully,

Suva, Fiji, Sept. 3rd, 1918. G. W. A. LYNCH.

THE AUGWIN DENTAL EMERGENCY OUTFIT.

THIS practical little dental emergency outfit has been designed by Mr. Augustus Winterbottom, F.R.C.S., L.D.S., for the use of sailors and soldiers on active service, and for general practitioners and those who are unable to obtain the services of a dentist. It consists of a neat metal case, measuring 5½ × 4¾ × 3 in., of which the contents are as follows: A mouth mirror, probes, excavator, scaler, and stopper for the insertion of temporary fillings and the treatment of carious teeth, together with bottles of dental plasters and counter-irritant solutions for the relief of pain. It also contains disinfectant tablets for the treatment of the different diseases of the gums, guttapercha, fluid temporary filling, and a suitable supply of cotton wool, rolls and pellets, with simple directions for use. As these directions are remarkably clear and explicit, and as, with the exception of the counter-irritant solution, which is suitably labelled, there is nothing likely to prove injurious in the hands of the unskilled, the outfit should, with regard to the Army, enable the officer or N.C.O. to give relief to his suffering comrades. It has happened in a great number of cases that, owing to the shortage of dentists near the front line, soldiers suffering from toothache have had to endure much pain before they were able to return to the base, where lay their only chance of receiving the necessary treatment. In such circumstances this little outfit should prove to be of great value. It should also do good service in the Navy, for the men are often at sea for long periods at a time and in circumstances when the mental strain is sufficiently severe, without the addition of physical torture. It actually happened that, in the early days of the war, an admiral, with all his responsibilities, had to suffer with an exposed nerve on either side of his mouth for three weeks before he could obtain proper dental treatment. The outfit is being made up by the Dental Manufacturing Co., Alston House, Newman-street, London, W. 1.

ACCURATE CLINICAL THERMOMETRY.

REFERENCE was made last week in our annotation columns to the Order issued by the Ministry of Munitions of War demanding that on and after Oct. 21st, 1918, no person shall sell, offer for sale, supply, or deliver any clinical thermometer which has not been tested, approved, and marked in accordance with rules made by the Controller of Glassware Supply on behalf of the Minister of Munitions, in consultation with the Local Government Board and the Department of Scientific and Industrial Research.

We now understand that no steps will be taken to enforce the Order until Nov. 21st. The period during which clinical thermometers will be approved if they show an error of no more than 0·4° F. will be extended so as to include those received at the National Physical Laboratory on or before that date. This extension, however, only applies to stocks held on the date of the Order (Oct. 11th) by dealers other than manufacturers.

A HOME SCHOOL WANTED.

To the Editor of THE LANCET.

SIR,—Can any of your readers recommend a home school, preferably on the East Coast, where a girl of 15, subject to mild epilepsy, would be received for general education?

I am, Sir, yours faithfully,

R.N. Hospital, Haslar, Oct. 23rd, 1918. HILDRED CARLILL.

Practitioner.—It is a fact that in all large establishments some amount of clerical and organising work falls to the medical men. We fear this is part of the system under which, at any rate in older days, officers of the R.A.M.C. as they rose in seniority became more of organisers and less of clinicians.

Vacancies.

For further information refer to the advertisement columns.

Bexley, Kent, London County Mental Hospital.—Asst. M.O's. 7 gs. a wk.
Birmingham City Sanatorium and Anti-Tuberculosis Centre.—Jun. Asst. M.O. £350.
Birkenhead Union.—Sen. and Jun. Res. Asst. M.O's. £350 and £300
Bradford.—Temp. Asst. Sch. M.O. £8 8s. per week.
Bristol Royal Infirmary.—H.P. and H.S. £130.
Dagenham (Temporary) Sanatorium.—Res. M.O. £300.
Dorchester, Dorset County Council Education Committee.—School Dentist. £350.
Greenwich Union Infirmary.—Asst. M.O. £300.
Hastings, East Sussex Hospital.—H.S. £250.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. 30 guineas. Also Asst. Res. M.O. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £100.
Huddersfield County Borough.—Female Asst. M.O.H. £400.
Kirkburton, Storthes Hall Asylum, Huddersfield.—L.T. £7 7s. per wk.
Leeds City Public Health Department.—Female Med. Asst. £400.
London Temperance Hospital, Hampstead-road, N.W.—Medical Registrar. 40 guineas.
Manchester, Crossley Sanatorium, Delamere Forest, Cheshire.—Asst. M.O. £300.
Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill road.—H.S. £150
Netley, Welsh Military Hospital.—M.O. £400.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Asst. Res. M.O. £250. Also H.P.'s. and H.S.'s. £50, and (in one case) £100.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Lect. Psych. Med.
Plaistow Fever Hospital.—Asst. M.O. £300.
Plymouth, South Devon and East Cornwall Hospital.—H.P. £200.
Queen Charlotte's Lying-in Hospital, N.W.—Asst. Res. M.O. £60.
Reading, Royal Berkshire Hospital.—H.P. £250.
Rhondda Urban District Council.—Dent. S. £350.
Royal London Ophthalmic Hospital.—Deputy Bacteriologist. £120.
Salford Royal Hospital.—H.P. £250. H.S. £200. Jun. H.S. £150.
South London Hospital for Women.—Female Clin. Asst. £1 1s. per attendance. Also Anæsth. 10s. 6d. per attendance.
Stepney Tuberculosis Dispensary.—M.O. £500.
Wakefield, Clayton Hospital.—H.S. £250.
Western General Dispensary, Marylebone-road, N.W.—Hon. Oph. S.
West London Hospital, Hammersmith-road, W.—H.S.
Whitechapel Dispensary for the Prevention of Consumption, Whitechapel, E.—M.O. £300.
Wilts County Council.—L.T. for M.O.H. 14 guineas per week.

APPOINTMENTS are vacant for a Medical Referee under the Workmen's Compensation Act for County Court Circuit No. 6 (St. Helens and Widnes) and County Court Circuit No. 7 (Birkenhead and Runcorn). Applicants, who should reside in the respective neighbourhoods, should communicate with the Private Secretary, Home Office, not later than Nov. 6th.

Births, Marriages, and Deaths.

BIRTHS.

FOOT.—On Oct. 15th, at Rydal, Crawley Down, Sussex, the wife of Captain T. J. Foot, R.A.M.C., of a son.
ILOTT.—On Oct. 16th, at Seaton, Devon, the wife of Captain Cyril H. T Ilott, R.A.M.C., of Bromley, Kent, of a daughter.
KENNEDY.—On Oct. 17th, the wife of Major C. M. Kennedy, F.R.C.S., R.A.M.C., of a son.
SAWYER.—On Oct. 14th, at Farquhar-road, Edgbaston, Birmingham, the wife of Lieutenant-Colonel J. E. H. Sawyer, R.A.M.C., of a son.

MARRIAGES.

MATHEWSON—HAMMOND.—On Oct. 16th, at West Ham Parish Church, George Douglas Mathewson, M.B., F.R.C.P.E., Temporary Major, R.A.M.C., to Alice Henrietta, second daughter of Captain and Mrs. Hammond, Forest Gate, Essex.

DEATHS.

FINCH.—On Oct. 8th, at the Officers' Hospital, Basra, Mesopotamia, Captain George Finch, R.A.M.C. (T.F.), late of Ipswich, of pleuro-pneumonia.
NIGHTINGALE.—On Oct. 17th, at Sloane-street, suddenly, of pneumonia, Percy Athelstan Nightingale, M.D. Edin.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

MANAGER'S NOTICES.

THE LANCET is published weekly, price 10*d.*, by post 10½*d.* inland, and 11½*d* colonies and abroad.

SUBSCRIPTION RATES.

INLAND	One Year	£1	16 0
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Subscriptions may commence at any time, and are payable in advance. Cheques and P.O.'s (crossed "London County Westminster and Parr's Bank, Covent Garden Branch") should be made payable to Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

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